Advancing the application of climate and hydrological information and its translation into policy

Panama City, Panama, 6 - 8 October, 2015

Workshop Report

Prepared by Katinka Waagsaether (CSAG), Tracy Cull (Kulima) and Katharine Vincent (Kulima)

IDRC | CRDI
International Development Research Centre
Centre de recherches pour le développement international

Canada

Climate System Analysis Group

KULIMA
INTEGRATED DEVELOPMENT SOLUTIONS

CATHALAC
SCIENCE, EDUCATION, AND POLICY FOR PEOPLE

Table of Contents

Acronyms

CATHALAC	Water Center for the Humid Tropics of Latin America and the Caribbean
CCW	Climate Change and Water
COP	Community of Practice
CSAG	Climate System Analysis Group
EWS	Early warning system
GCMs	Global Climate Models
IDRC	International Development Research Centre
PI	Principal Investigator
UCT	University of Cape Town
WEAP	Water evaluation and planning

Executive Summary

The Panama workshop - *Advancing the application of climate and hydrological information and its translation into policy* - was targeted at country teams comprising modellers, principal investigators (PIs) and policy-makers from International Development Research Centre (IDRC)-funded Climate Change and Water projects in Latin America, the Caribbean and Asia. The main aim of the workshop was to strengthen science-society communication pathways by giving participants the opportunity to reflect on the challenges and opportunities of applying climate and hydrological information into policy.

In order to meet the aim of strengthening science-society communication pathways, the structure of the workshop was designed around key objectives:

- Visioning an 'Ideal World' where understanding between policy/decision makers and scientists is possible and useful for both parties;
- Identifying what needs to be put in place to achieve the visionary ideal world;
- Identifying immediate and practical next steps for each project to contribute to the ideal world and the nature of a community of practice.

Visioning an ideal world

An ideal world was seen to be one in which science-society communication pathways are characterised by an open, transparent and interdisciplinary knowledge generation process, and where reliable and robust scientific information is used for planning and decision making. This situation is characterised by a number of circumstances. These all stem from the underlying prerequisite that scientists understand the context of decision-making for policy-makers, and policy-makers understand the realities of the robust scientific process. In such an ideal world, it would be the case that:

1) We all **understand each other's 'language'** and scientists are able to translate data into information and messages that are relevant to policy-makers (where translation has two dimensions: framing and literal – with the need for information in local and indigenous languages particularly recognised)

2) **Communication is central** with people talking to each other within groups and across groups, continuously or at key points in time

3) There is a **match between the time horizons** of the scientists and policy-makers

4) We understand each other's **context**

5) **Information is plentiful, accurate and holds low levels of uncertainty**

6) We are **learning from the past** (in both successes and mistakes)

7) We have **resourced fora and platforms** for knowledge sharing and, where appropriate, decision making

8) We have **access to resources**

9) We have an **open, transparent and interdisciplinary knowledge generation process**

10) **Scientific information** is used for planning and decision-making

11) The **media** is spreading awareness and being used effectively by scientists

12) Policy-makers have more **knowledge**

What needs to be put in place to achieve the ideal world

Participants identified six key 'big picture' actions which are necessary to enable the achievement of an ideal world. There was little distinction between the sector groups, i.e. modellers PIs and policy-makers, in the importance of these actions, which related to improved availability of information, politician engagement,

exposure of scientists and policy-makers to each other's worlds, better alignment with decision-making timeframes and priorities, and mechanisms to enable improved communication.

Wish 1: To have more funding: to generate information and to implement recommendations arising from the research

Examples of new information required included long-term observations and data rescue, as well as increased ground measurements to calibrate models and help with bias correction. Improved research is also important for validating information generated by universities and others, such as NGOs. Implementation of recommendations arising from research include aspects such as incorporation of climate and hydro-related information for water resource management. Another idea was is that of "data democratization" – including building more observational stations, but also the idea of putting observational stations in schools and making them part of a science programme to create young science literacy.

Wish 2: To make politicians aware of the bigger picture and take a more holistic approach to legal and institutional issues

The critical role of politicians was highlighted in science-society relations. As the ultimate directors of decisions, and creators of the decision-making context, the policy-makers themselves complained that politicians do not necessarily see the value of the bigger picture, and are therefore less open to alternative management strategies or approaches. Modellers wished that politicians would listen to and use, or at least allow, the presentation of a range of alternative research results.

Wish 3: Management tools to be taken up by policy-makers

More effective use can be made of existing management tools that use science to inform decision-making – for example the water and land use models WEAP and LEAP. Continuous engagement between policy-makers and scientists was another wish. Early and timely engagement not only benefits policy-makers but modellers too, as involvement of policy-makers means that the correct model can be used from the start of the project and the appropriate information can be generated. In this context policy-makers further highlighted that there is a lack of forum to bring scientists and policy-makers together on a continuous basis, meaning that they tend to only engage when an extreme event is just around the corner or when it has already occurred.

Wish 4: To have better communication between all players

A number of the wishes and the envisioned ideal world are underpinned by the need for better communication between all players. Better communication means tailoring information for different target groups. This requires that, for example, scientists break down their messages and generate policy relevant messages and information which, in turn, requires that they understand the type of information that policy-makers regard as important.

The issue of credibility of information is also important. Poor understanding of uncertainty and the limitations of science means that when model outputs contradict reality, there is loss of trust in the information. While it is relatively easy to present research when evidence moves in the same direction as current trends, it is much more difficult to present research that does not. Alternative framing of the situation, that is designed by scientists and policy-makers together, may be a solution enabled by communication. Looking for solutions, rather than problem statements, can immediately make science more relevant to policy. Better packaging and tailoring information can be enabled by partnering with professional communicators to develop different messages for different end users at different levels of governance.

Wish 5: Alignment of project and government planning timeframes

There is a need to overcome existing challenges, which typically see scientists progressing at a speed slower than that of policy-makers. Policy-makers at different governance levels can have different planning cycles, and thus it is important to be aware of these before trying to align (e.g. national planning might be on a five year cycle, whilst municipal planning might be on an annual cycle).

Wish 6: Autonomy from donor politics and priorities

Overcoming donor politics, and the way in which it can distort development priorities in the global south, was also a key wish. Modellers pointed out that not all development issues are directly related to climate change. It was recommended that donors should engage more with local stakeholders and scientists to understand the local context and research challenges to avoid making climate change a scapegoat for all problems, and thereby potentially overlooking the correct solutions.

Overcoming challenges and turning wishes into reality

The wish list of actions arising from session two was consolidated into six questions regarding how best to turn these wishes into reality. These included:

- **Challenge 1: What structures and processes would facilitate effective communication between the modellers, PIs and policy-maker/stakeholders within CCW projects?**
- **Challenge 2: What structures and processes would facilitate effective communication between the CCW project and civil society as well as how the outcomes of the project should be incorporated into decision-making frameworks?**
- **Challenge 3: How can CCW project cycles be aligned with government planning cycles so that information from the project is available on time for consideration in governance decision-making?**
- **Challenge 4: How can we persuade or influence governments and funders to expand the network of observation stations?**
- **Challenge 5: How can we best reconcile the time frames that modellers produce information for (typically 25-100 years) and those required by decision makers (typically 1-10 years)?**
- **Challenge 6: What type of programmes or activities could help sensitize modellers and policy-makers to each other's problems, needs and working contexts?**

Participants came up with a number of practical ways to address the challenges. The suggestions reflected emphasis on inclusivity and collective problem solving and consensus building, as well as on case appropriate forums and channels for communication and long term partnerships.

Next steps and establishing a community of practice

The workshop ended with participants outlining a list of actions that they will take forward in their projects in order to improve science-society communication pathways between modellers, PIs and policy-makers.

It was agreed that a community of practice would enable ongoing dialogue and sharing of experiences between participants in pursuit of an ideal world of science-society communication. Various activities and outputs for such a COP were mooted. The setting up of a facebook page was considered the first step in a low maintenance platform for engagement. The importance of face-to-face meetings, to supplement virtual interaction, was highlighted. Given the resource-intensive nature of such meetings, clear, mutually agreed, goal are essential for success. Visits between members – to undertake research together or share knowledge (for example, through seminars) is another possibility. Published papers are a key mechanism for COPs to share their own experiences with wider audiences. Since writing teams with authors based in different countries can cause logistical challenges, writeshops may provide the space for collaboration and joint thinking.

Science-society communication pathways

The workshop in Panama demonstrated that a foundation for a strong community of practice already exists amongst the PIs, policy-makers and modellers that attended, and that there is broad agreement on what is wanted in terms of an ideal world for science-society communication pathways, and what is needed to get there.

The discussions amongst, and between, the three sector groups highlighted the fact that there is recognition of, and respect for, the differences that exist between them in terms of how things are done and the priorities of each group. Discussions also showed that there is a strong willingness amongst all sector groups to embrace, change and see problems and issues from another's perspective.

Central to strengthening science-society communication pathways is time, space and resources to engage across the three groups, and with that improved understanding of each other's working language, context, needs and limitations. This workshop provided one such space, and is ideally an initial foundation and stepping stone for continued interactions.

1. Introduction

From 6-8th October 2015 a workshop on *Advancing the application of climate and hydrological information and its translation into policy* was convened in Panama City for representatives of the International Development Research Center (IDRC) Climate Change and Water (CCW) projects (see Annex A for the workshop agenda). 28 people from across Asia, Latin America and the Caribbean participated, of which six were policy/decision makers, eleven were CCW project Principle Investigators (PIs), and eleven modellers/scientists (see Annex B for participant details, and Annex C for biographies and CC project information). The workshop was organised and facilitated jointly by the Climate System Analysis Group (CSAG), the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) and Kulima Integrated Development Solutions

The workshop formed part of a project titled *Integrated Climate Change Modelling and Policy Linkages for Adaptive Planning.* The project is implemented by CSAG, and aims to bridge the knowledge gap between scientists who predict climate and hydrological futures, and policy-makers and planners which need to use this information. The method of the project is based on two workshops which aim to enhance learning pathways for integrating climate information (current trends and future projections) into decision-making on water resource management and create a community of practice. The Panama workshop formed the second of the two workshops.

This report provides a summary of the outputs of the workshop, whilst elaborating the participatory process through which they emerged.

1.2 Project progress before the Panama workshop

The first project workshop - *Challenges of Integrated Climate and Hydrological Modelling for Management and Policy Application* – took place in Cape Town, South Africa, between 27-30th October 2014, and targeted climate and hydrological modellers from CCW projects. It focussed on technical aspects, such as dealing with uncertainty and working with a variety of data, and on the need for cross-communication and sharing of data and approaches across the various CCW projects.

The objectives of the first workshop were to:

- Develop a common understanding of the potential and the limitations of climate/impacts modelling;
- Establish practice sharing amongst CCW projects about how to apply climate/impacts modelling and foster a CCW community of practice and strengthen peer to peer learning through exchange of experiences;
- Prepare the ground for the second workshop.

A key outcome of the first workshop was establishing the basis for a community of practice amongst the CCW projects to support the overcoming of the technical and procedural challenges. The opportunity of networking across the projects and sharing experiences and learning together was an important first step, and was formalised by the establishment of a 'group space' project website (http://groupspaces.com/CSAG-IDRC/). A second outcome of the workshop was an e-learning course (see Annex D). In this context of well-developed modelling communities of practice, the goal of the second workshop is to build relationships between the modelling community convened for the first workshop, and the policy-making community, within the context of the CCW projects in Asia, Latin America and the Caribbean.

2. Methods

2.1 Workshop approach and rationale

Whereas the first workshop of the project targeted climate and hydrology experts, this second workshop targeted country teams comprising principal investigators (PIs), modellers and policy-makers from CCW projects in Latin America, the Caribbean and Asia. For each of ten CCW projects involved, the PI was invited in company with a modeller working on the project. The two were further asked to identify and invite a local policy-maker to join them, someone with whom they had been actively engaging during the project.

The aim of the second workshop was to strengthen science-society communication pathways, and thus participants included not only modellers and PIs but also policy-makers. It did this by giving participants of

different backgrounds the opportunity to reflect on the challenges and opportunities of applying climate and hydrological information into policy and practice and to share experiences. The intention was to expand the focus of the communities of practice to include both technical experts and those who work at the interface of policy and practice. This, in turn, would facilitate the improvement of science-society communication and application of research findings.

The rationale behind the process design and the participatory nature of the workshop is grounded in the recognition of a persistent disconnect between modellers and policy-makers, and the subsequent need for an appropriate understanding between the two. Overcoming this disconnect requires a fundamentally different kind of engagement - one where user-producer facilitated science production takes place within a sustained community of practice.[1] The intention is to move away from the typical linear model of knowledge production, towards a more complex co-exploration model.

In order to meet the aim of strengthening science-society communication pathways through a co-exploration model the structure of the workshop was designed around three objectives. These were:

- Visioning an ideal world where understanding between policy/decision makers and scientists is possible and useful for both parties;
- Identifying what needs to be put in place to achieve the visionary ideal world;
- Identifying immediate and practical next steps for each project to contribute to the ideal world.

The three objectives formed the cornerstones of the process and structure of the workshop, where a common starting point (an ideal world) is followed by the surfacing of diverging views and tensions (challenges and barriers) after which there is convergence as the group then works towards practical steps for overcoming those challenges (steps towards achieving the ideal world)(Figure 1).

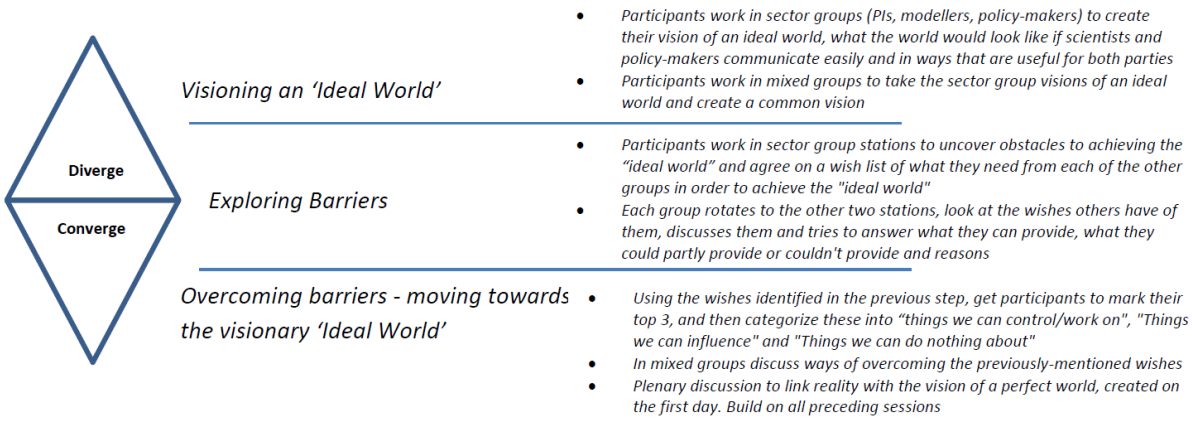


Figure 1: Initial Workshop Process

As is the case with most interactive, participatory processes flexibility is key. In this workshop elements emerging in step one necessitated modifications to steps two and three. The intention was to divide the participants into their three groups: PIs, modellers and policy-makers; on the assumption that there would be significant differences between them in terms of barriers and opportunities. In reality there were far more PIs and modellers than policy-makers. The PIs and modellers both seemed to approach the issues from a scientific perspective, and the lack of differences meant that the wish lists that came out of step two, 'Exploring the Barriers,' were not as specific as expected and had big overlaps across the three groups. The third step was therefore re-designed to be a more collective approach to identify ways of overcoming the barriers and achieving the ideal world (Figure 2).

[1] Steynor, A., M. Gawith and R. Street, 2012: Engaging users in the development and delivery of climate projections: the UKCIP experience of UKCP09.

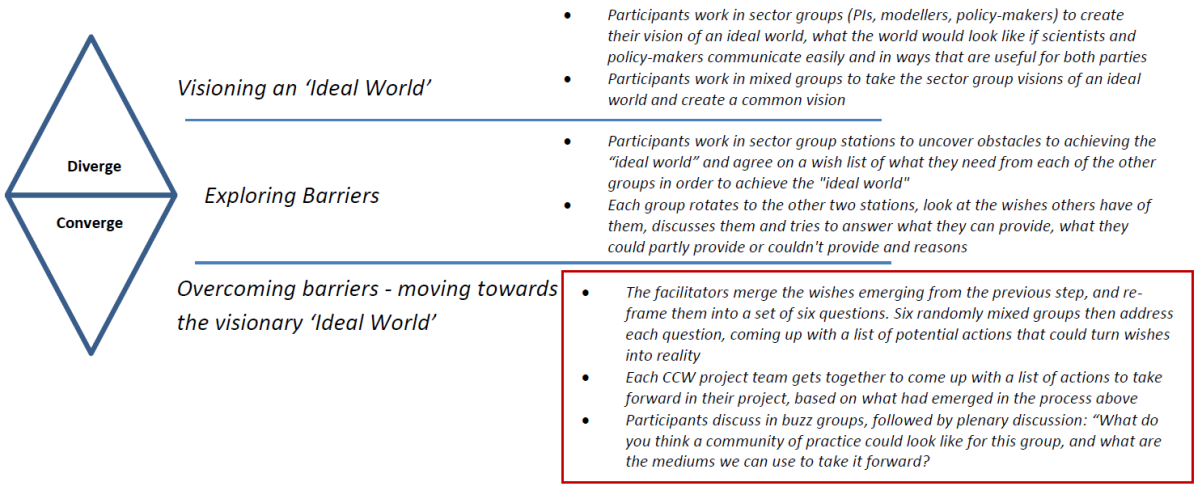


Figure 2: Adapted Workshop Process (changes in the red box)

2.2 Workshop structure

2.2.1 Visioning an ideal world

Workshop participants were split into the three sector groups (PIs, policy-makers and modellers) and were asked to brainstorm what their ideal world would look like. Guiding questions were provided to help the participants in this visioning exercise, i.e.

How do you see your model outputs being effectively used?

What is needed to inform policy?

What would it look like if scientists and policy-makers communicated perfectly?

2.2.2 Identifying what needs to be put in place to achieve the ideal world

The initial aim of the second session was to identify the obstacles/ challenges to attaining the ideal world envisioned by the groups in the first session. However, it became apparent that many of these challenges were implicit in the ideal world descriptions. Instead participants went directly to the identification of wishes and related examples. This was done using a carousel – each sector group (PIs, modellers and policy-makers) discussed first, and then an "anchor" stayed behind and the rest of the group moved on so that each sector group had the opportunity to see the emerging thoughts of the other two.

2.2.3 Overcoming challenges and turning wishes into reality

The wish list of actions arising from session two was consolidated into six questions regarding how best to turn these wishes into reality. Participants were split into six mixed groups and each group was asked to consider one question and then report back to the main group.

2.3 Workshop inauguration and special guests

The official opening of the workshop was facilitated by Zvia Danon from CATHALAC, and featured a speech by the Honourable Emilio Sempris, Deputy Minister of the Ministry of Environment in Panama. Dr Chris Lennard (CSAG), José Alarcón Mella (Deputy Minister of Soil and Water, Dominican Republic), Honourable Emilio Sempris (Deputy Minister of the Ministry of Environment in Panama), Dr Freddy Picado (Director CATHALAC), Dr Charlotte MacAlister (IDRC) and Walter Ubal Giordano (IDRC) participated in the inauguration (Picture 1).

Picture 1. From the left: Dr Chris Lennard (CSAG), José Alarcón Mella (Deputy Minister of Soil and Water, Dominican Republic), Honourable Emilio Sempris (Deputy Minister of the Ministry of Environment in Panama*)*, Dr Freddy Picado (Director CATHALAC), Dr Charlotte MacAlister (IDRC) and Walter Ubal Giordano (IDRC).

3. Findings

This section outlines the main thematic points arising from each session. Boxes illustrate some of success stories provided by participants.

3.1 Visioning an ideal world

The overall ideal world visions were common among the three sector groups, although perspectives on what their future would look like did differ. Of the 12 overall themes that emerged, the first five came out most strongly, and thus the elaborations of the different sector groups are provided for these.

Picture 2: Groups working on their ideal world vision

1) We all understand each other's 'language' and scientists are able to translate data into information and messages that are relevant to policy-makers

It is important to note that there are multiple dimensions to the required translation: the translation from scientific language into useable information; and then the literal translation from official country languages (e.g. English or Spanish) into local languages.

Particular visions of different sector groups were for an ideal world where:
Modellers:

- Standard terminologies are understood by all, while at the same time maintaining scientific accuracy
- Key role of knowledge brokers in the translation of data and information

- Focus on how data can be presented beyond graphs and tables
- Information is tailored based on user needs

PIs:
- Climate change data and information is translated into economic terms of sectoral implications (for example through the general economic impacts of a 3°C warming, the implications of climate change for tourism or the adaptation return on investment)
- Scientists focus more on solutions, rather than merely presenting the vulnerabilities and impacts
- Information is tailored based on user needs

Policy-makers:
- Scientists provide politicians with integrated solutions
- Better translation of science can create political support
- Senior scientists participating in politics to ensure effective integration of science in policy

---

The importance of making information available in appropriate languages

Example from Bolivia

We are facing issues with translations: there are many indigenous people part of the decision making groups, so we have to be very clear.

We have a group of women leaders, 25 women, and when we showed them the data they have asked for more data - so they are interested and want to better understand the information.

Example from the Asian Highlands

A bigger problem is translating all the science into the local languages. For example, in Nepal climate and season is usually described by the same word. Usually no one is talking about climate change, they are talking about seasons.

---

2) Communication is central-with people talking to each other within groups and across groups, continuously or at key points in time.

Particular visions of different sector groups were for an ideal world where:
Modellers:
- Long term relationships and continuous communication with policy-makers exists at all stages of a project, specifically emphasizing engagements at project conceptualization
- Government ministries talking to *each other* when developing policy
- End-users (e.g. farmers), local authorities and national government all interacting with each other

PIs:
- Long term relationships and continuous communication with policy-makers at all stages of a project, specifically emphasizing engagements at project conceptualization
- Recognition of the many levels in the decision-making process, and how interacting with people working at the technical level best creates conviction in the decision making process

Policy-makers:
- Communication of needs and knowledge going two ways
- Ownership being created on both sides – science and policy

Example from Central America and the Caribbean

To have the environmental authority working on the project helped open the door to access data, and it also helped us get insight into the type of outputs that they would like to see from the project. Then, in the workshop about project outputs, they were really listening in. The municipality now want us to help them determine future availability of water, and that is what we will do next year.

Example from Chile

We are working in a basin area, and from the beginning we incorporated as many stakeholders as possible. We thought incorporating the stakeholders and doing collaborative modelling was key. We felt that they are the ones who better understand how the system works, and their insights will help us to do better modelling (e.g. for the water system of Santiago).

We also wanted to understand the levels of vulnerability of each of the stakeholders and areas. Not the impacts, but what the thresholds are that we are working with, and the probability of these being reached.

Some challenges in the process include the initial lack of trust. Sometimes the stakeholders did not trust the project, so we had to gain that trust. Also, expectations of the stakeholders were a problem, as we did not want to create massive expectations. For example, if we say we will provide something, but later see that we won't be able to – then what do we do?

Things that have gone well included choosing to identify and work with the stakeholders that we thought would stay, often stakeholders from the middle rather than the highest level.

Another thing that has gone well is the participatory newsletter, to which all the stakeholders regularly contribute.

3) There is a match between the time horizons of the scientists and policy-makers

Particular visions of different sector groups were for an ideal world where:
Modellers:

- Information is provided at adequate/stakeholder-specific lead-times
- There is continuity in government programmes beyond the time frames of election cycles
- Long term funding programmes exist to enable this vision

PIs:

- A match between the time horizon of policy-makers and scientists exists (whilst recognising the difficulty related to providing robust scientific recommendations in the short term)

Policy-makers:

- People involved in decision making have moved from a short term to a long term view, matching the more long term perspective of scientists

Example from Argentina – model output timeframes longer than policy

We have tried to involve decision makers from the beginning. Our first meeting happened within a workshop focused on understanding models, because we wanted them to understand the models and how they work. The models themselves were chosen within the group, but throughout all the meetings the decision makers have been involved and giving input on appropriate geographical scales and have identified areas that scientists need to pay attention to.

We have found that one of the challenges were the short term focus of organisations, while models focus middle and long term. So to make the stakeholders see that as important was challenging. Scenario systems - some of these are very complex, and decision makers did not always understand them and therefore opposed related adaptation measures. But when we explained they went with it. We were able to train people in government to better understand hydrological systems.

Example from Guatemala, Nicaragua and Costa Rica – policy timeframes longer than project scope
We are covering the central American region, using the regional climate change strategy as our guideline. What we believe is that it is useful to at least raise awareness for planning. But, planning processes are more long term than the actual project. We have to overcome a number of barriers related to development, which we believe is the main priority.

4) We understand each other's context

Particular visions of different sector groups were for an ideal world where:

Modellers:

- Scientists understand national priorities and the information needs of the users across governance scales
- Scientists understand how information is disseminated to other communities
- Policy-makers and other decision-makers understand the limitations of models as tools, as well as the limitations of their outputs

PIs:

- There is common understanding among the actors in the landscape, in terms of each party's role and needs (including the frameworks of, and boundaries faced by, decision makers)

Example from the Caribbean

In the Caribbean region there many different islands and models represent these differently and thus provide different outputs.

Interactions with people in communities has provided information for the water management authority and further provided input that helped us build the water models. The experience of people on the ground was different to that of the water management authority. We started collaborating with local people, and realised that we need to listen more to people and we feed this information into our model. The local knowledge is central to fill the gaps.

---

5) Information is plentiful, accurate and holds low levels of uncertainty

Particular visions of different sector groups were for an ideal world where:
Modellers:

- Low levels of uncertainty exist in projections

PIs:

- Accurate information wins the confidence of policy-makers. For example, if weather forecasts are accurate policy-makers are more likely to trust the scientists, and as a result, more likely to be open to look at climate change projections and to focus more on the long term

Policy-makers:

- As much intelligence as possible exists

Example from Peru

A major part of the project was to understand the El Niño phenomenon. We had an experience last year when many researchers said there would be a super El Niño and journalists published on this. A research group then said that this would not happen, and when it did not happen they gathered a lot of trust. That gave them strength for this year, when they said there is 50% chance of a strong El Niño phenomenon. The majority of the actions now are very strong, despite there only being 50% chance.

Example from the Asian Highlands

Temperatures are rising, but the trouble is the uncertainty with regards to precipitation. In one study we looked at the GCMs and it turned out that precipitation could decrease by 55% or increase by 110%. This was not very useful, and it was next to impossible to communicate. How do you get the political forces to understand that, and that is the challenge.

---

6) We are learning from the past

This includes learning from both successes and failures, and putting in place a monitoring system for implementation of model-informed policy.

7) We have resourced fora and platforms for knowledge sharing and, where appropriate, decision making

At a minimum such fora should bring together scientists and policy-makers, but ultimately it would be ideal to use such platforms for dialogue between all members of society.

8) We have access to resources

Provision of research with the temporal and spatial resolution required by policy makers requires access to suitable observational data as well as costly computational technologies.

9) We have an open, transparent and interdisciplinary knowledge generation process

The envisaged dialogue and improved communication would lead to an open process for the creation of the best possible information, with general honesty in terms of what research can and cannot achieve.

10) Scientific information is used for planning and decision-making

Examples of the use of scientific information for planning and decision-making may be the use of model outputs in national development plans, and resilient communities that use scientific information for decisions.

Example from Cambodia

At the beginning of the project we consulted policy-makers (local provincial and national) and communities, and we got some recommendations from them. For example, we got insight into local women's problems, and got better understanding of the status of the catchment. We provided some recommendations back to them for better management of the catchment, and they appreciated this. They did have some difficulties implementing the recommendations though, due to limited human and financial capacity.

11) The media is spreading awareness and being used effectively by scientists

A world where media plays an important role in increasing awareness was envisioned by the PIs, while policy-makers envisioned a world where scientists used media more effectively.

12) Policy-makers have more knowledge

Policy-makers themselves envisioned that they would have more knowledge, and that scientists play a central role in transferring the knowledge.

In the second part of the visioning exercise on Day 1, participants were divided into mixed groups (across PIs, modellers and policy-makers) and asked to agree on an ideal world and communicate this in a creative medium. The revision of the ideal world visions by mixed groups led to more narrowed down messages, outlined in table 1.

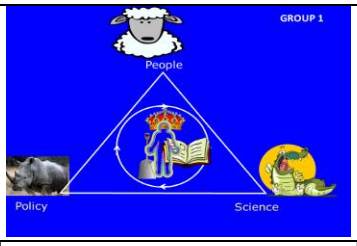
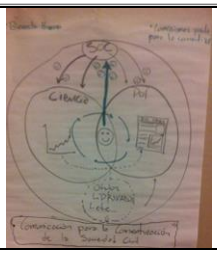
Group 1		Group 1 vision of an ideal world where there is continuous interaction between policy, science and general people. People tend to be like sheep, going along with everything that is found. Scientists are like crocodiles, and tend to scare people. Policy-makers are a bit like rhinos, they only respond two days after you knock them.
Group 2	Information is accurate and understood by ALL Information is available and understood by ALL We know that each of us can make a difference We live in harmony with the environment All people come together, respect each other, exclude no one and respond appropriately	Group 2 vision of an ideal world, performed with clapping, singing and a lot of enthusiasm.
Group 3		Group 3 vision of an ideal world. The big circle represents the society that everyone is part of, and the two smaller circles represent science (on the left) and politics (on the right). The vision is one where everyone communicates and works together to meet an ultimate objective – filling the needs of the society and human wellbeing.

Table 1: Mixed groups, consolidated visions of an ideal world

3.2 Identifying what needs to be put in place to achieve the ideal world

The wishes could be clustered into six groups that variously reflect provision of new information, better use of information and improved communication. In this exercise participants were encouraged to link their big picture ideal world visions to tangible actions that would be required to progress towards those visions. This section thus contains specific country and project-related examples of both needs and good practices (note that more information on each project can be found in Annex C). In addition, the modellers had some specific science-related wishes which are highlighted in the box.

The modellers' science-related wish list

- Removed/low bias from climate & hydrological models OR Standard method for bias correction
- Data at high spatial resolution in a usable format
    - Climate data
    - Soil data
- Long-term observations and data rescue
- Increased ground measurements
- Diminish negative impact of flooding
- Early warning systems in all regions, regional EWS
- Good computing power
    - Ability to use the computing facilities
- Solid funding for research
- Incentives to improve human resources in hydrology and climate research – more people to work with both climate and hydrology models

Box 1: The modellers' science-related wish list

Picture 3: A group working on their wish list

Wish 1: To have more funding: to generate information and to implement recommendations arising from the research

Modellers were able to elaborate a fairly extensive science-related wish list (box 1). Other funding priorities to generate information include ***long-term observations and data rescue*** – in Central America over half of the records are still in paper format (a suggestion was made that students could be used to digitize data) – as well as for ***increased ground measurements to calibrate models and help with bias correction*** (for example, in Chile for glacier observations and Argentina for meteorology radar). Improved research is also important for ***validating information generated by universities and others, such as NGOs*** (as is currently happening in Bolivia).

Modellers also highlighted the need for more funds for applying or implementing the recommendations that arise from research. For instance, climate and hydro-related information is needed for water resource management, with information inputs into regional early warning systems (EWS) having the potential to diminish the negative impact of flooding (some early warning systems are already doing this). Another idea from Nepal and the West Indies is that of 'data democratization' – including building more observational stations but also the idea of putting observational stations in schools and making them part of a science programme to create young science literacy. Linking outputs from the stations with local radio stations (for instance, via SMS) would sensitize the community to the value of weather and climate data which may, in turn, create a greater demand for EWS.

Wish 2: To make politicians aware of the bigger picture and take a more holistic approach to legal and institutional issues

The critical role of politicians in science-society relations was highlighted. As the ultimate directors of decisions, and creators of the decision-making context, the policy-makers themselves complained that politicians do not necessarily see the value of the bigger picture, and are therefore less open to alternative management strategies or approaches. Modellers wished that ***politicians would listen to and use, or at least allow, the presentation of a range of alternative research results*.**

An example was given of water flow from one state to another in Argentina and the resulting conflict that was politically-generated and may have been different if scientific inputs were considered. This point (for politicians to be more 'open minded') was echoed by the PIs at the workshop who explained "When we meet with politicians they don't want to share data or use data."

Wish 3: Management tools to be taken up by policy-makers

More effective use can be made of existing management tools that use science to inform decision-making – for example the water and land use models WEAP and LEAP. Continuous engagement between

policy-makers and scientists was another wish, with the Cambodian CCW project highlighted as an example where policy-makers have successfully engaged throughout the project. Early and timely engagement not only benefits policy-makers but modellers too, as ***involvement of policy-makers means that the correct model can be used from the start of the project*** and the appropriate information can be generated. In this context policy-makers further highlighted that there is ***a lack of forums to bring scientists and policy-makers together*** on a continuous basis, meaning that they tend to only engage when an extreme event is just around the corner or when it has already occurred.

All sector groups recognised they have a role to play to make this happen. They also recognised the role of intermediaries who can play the role of ***translating model outputs into the formats required*** and understood by policy-makers. These might be values in economic terms or by providing a business case.

Wish 4: To have better communication between all players

A number of the wishes and the envisioned ideal world are underpinned by the need for ***better communication between all players.*** The consequences of a lack of continuous flow was highlighted by the policy-makers from Chile who stated that in the event of extreme events, such as floods and landslides, there has not been communication between scientists and policy-makers resulting in reactive, rather than proactive, responses. A case study example from Peru was more successful. Here multi-disciplinary groups were set up around water resources, agriculture, etc. primarily to communicate El Niño information.

Better communication means ***tailoring information for different target groups*.** It is not enough to put in place opportunities or policies for closer collaboration – instead there needs to be a proactive commitment on both sides to communicate information in a language and manner in which it can be effectively understood. This requires that, for example, scientists to break down their messages and generate policy relevant messages and information which, in turn, requires that they understand the type of information that policy-makers regard as important. In the Caribbean, politicians understand the problems and issues in relation to climate change, but are stuck on how to integrate the information in decisions. What they need is specific information on short term basis and season forecasts that they can use to make decisions on local management.

The issue of ***credibility of information*** is also important. Poor understanding of uncertainty and the limitations of science means that when model outputs contradict reality, there is loss of trust in the information. While it is relatively easy to present research when evidence moves in the same direction as current trends, it is much more difficult to present research that does not. For example, in Chile there have been problems with drought throughout the CCW project so far, with projections indicating a continued drought project into the future. Yet if there had been good rains during the course of the project it would have been a lot more difficult to engage the policy-makers and keep them interested.

Alternative framing of the situation, that is designed by scientists and policy-makers together, may be a solution enabled by communication. Looking for solutions, rather than problem statements, can immediately make science more relevant to policy. In Nepal, for example, a large amount of complex background science (biophysical / social / economic) was prepared, which was indigestible to end-users. The CCW project 'translated' this into a 14-point plan of practical actions. The process started with taking the whole team out into the field to meet local people so that policy-makers could see directly how the changes described by the science affect them in the reality. The information was then used to develop a 'masterplan' in a collaborative way.

Better packaging and tailoring information can be enabled by ***partnering with professional communicators*** to develop different messages for different end users at different levels of governance. Modellers wish for the existence of a tool to translate science evidence into policy (they did not regard the current example of policy-relevant science – the IPCC Summary for Policymakers – very highly). This communicator should be involved throughout a project so that they are familiar with the models/output/process.

Wish 5: Alignment of project and government planning timeframes

There is a need to overcome existing challenges, which typically see scientists progressing at a speed slower than that of policy-makers. Since scientists are also accustomed to only releasing final results at the end of a project, there is a need to reconsider availability of information for immediate needs without compromising quality and robustness. In Nepal and Pakistan, for example, the challenge is the extreme short-termism, where policy-makers focus on a few months, a few years at the most. This may require ***a more dynamic engagement with policy-makers during the research process***. Policy-makers at ***different governance levels can have different planning cycles, and thus it is important to be aware of these before trying to align*** (e.g. national planning might be on a five year cycle, whilst municipal planning might be on an annual cycle). CATHALAC has a project where they have first built the foundation of information, so that they are now prepared to respond to government's questions. In Argentina modellers provide climate scenarios and information from hydrological models but they are not sure if it is being used yet, as it is still being produced. There have been discussions about how information should be presented, and usually the policy-maker wants more than the scientist can provide.

In the same way scientists need to adapt their approach, so do policy-makers. In particular there is a wish for ***policy-makers to think beyond the near term in their planning***. In Bangladesh, for example, modellers worked a lot with government – they trained government officials, did a lot of engagement, and asked them to decide who should take the lead role with regards to climate change issues. In this case the modellers saw it as their role to change the attitude and raise awareness of the policy-makers/ government officials.

Wish 6: Autonomy from donor politics and priorities

Overcoming donor politics, and the way in which it can distort development priorities in the global south, was also a key wish. Policy-makers from Chile asked why they had to, for example, justify a new transport system in an area that had previously not had one, in the context of climate change. Modellers pointed out that not all development issues are directly related to climate change. For example, water resources in the Punjab, India, are under threat but this is due to over-exploitation and not directly because of climate change. It was therefore recommended that ***donors should engage more with local stakeholders and scientists to understand the local context*** and research challenges to avoid making climate change a scapegoat for all problems, and thereby potentially overlooking the correct solutions.

3.3 Overcoming challenges and turning wishes into reality

Mixed groups discussed how to overcome the challenges emerging out of the wish list generated in the previous session.

Challenge 1: What structures and processes would facilitate effective communication between the modellers, PIs and policy-maker/stakeholders within CCW projects?

Participants agreed some kind of ***'agreement table' forum*** would be important, at which the different players could meet. This table could be virtual and facilitated through video or radio. Other ideas included ***policy interaction days***; ***formalised partnerships between different stakeholders*** and institutions as well as the distribution of a newsletter written by different actors. The group highlighted the need to bear the target population in mind when deciding on which structure or process was most appropriate and considered structures ranging from the usual (a Steering Committee) to the more unusual (a soccer championship!).

Challenge 2: What structures and processes would facilitate effective communication between the CCW project and civil society as well as how the outcomes of the project should be incorporated into decision-making frameworks?

Existing civil society participation processes and channels, such as fora with leaders from the communities, were identified as critical communication channels. ***Inclusion of all players in the defining of instruments and procedures*** was also deemed important in order to ensure science generation meets societal needs. Outcomes of the project could be incorporated through early warning systems, diffusion fora and adaptation plans made with the input of leaders and affected communities.

Challenge 3: How can CCW project cycles be aligned with government planning cycles so that information from the project is available on time for consideration in governance decision-making?

Taking into account the large differences in the nature and timescale of the planning processes in different countries, it is important to ***build consensus between government planners and researchers,*** and that more interaction between the two groups should be encouraged. At the national level government should be supported through the ***provision of timely and targeted information*****.** It was also noted that different information is likely required at other levels of planning, but that all information should be transparent.

Challenge 4: How can we persuade or influence governments and funders to expand the network of observation stations?

Governments and funders need to be shown the benefit of stations, including the fact ***that installing observation stations is cheaper than the damage caused by unanticipated hazards***. It would be helpful if they understood that better data availability can lead to more accurate forecasts at the relevant scale to inform their decisions. One way to ***promote the value of stations was through social networks, strong lobbying and a good website***. Finally, the group suggested that the way to really influence governments and funders is to show that the ***stations can earn funds by selling the data to the private sector.***

Challenge 5: How can we best reconcile the time frames that modellers produce information for (typically 25-100 years) and those required by decision makers (typically 1-10 years)?

Possible solutions to reconcile timeframes included the ***setting up of long-term partnerships with appropriate funding***. Solutions also included the creation of ***parliamentary committees*** or, where possible, ***capitalising on existing groups*** to support these partnerships. Modellers were encouraged to ***model short term local impacts*** in order address with decision-makers timeframes. Other ideas were to ***influence politics*** to get politicians to think more long term/ be more aligned with modelling timeframes. ***Engaging mass media to change public opinion***, and through that force short-term politicians to think long term, was also mooted.

Challenge 6: What type of programmes or activities could help sensitize modellers and policy-makers to each other's problems, needs and working contexts?

Learning to empathise with different sector groups requires that ***people step outside of their comfort zone***. For example, policy-makers could be made aware of what happens in modelling by attending a short (1-3 days) workshop on model development. The aim of the workshop would not be to train them as modellers, but to enlighten them about the type of data that is needed and the limitations as well as importance of this data to drive the model. On the other hand, it was noted that modellers need to understand the views and the needs of the policy-makers, so that they do not focus solely on their own interests. The group made the analogy to a company, where, no matter what job a person has, it is important for them to learn the workings of the company and the role of each person in order for the company as a whole to function effectively. The focus is on the collective system producing one output.

El Niño events in Peru were highlighted by the group as an opportunity for everyone to work on an issue that is impacting everyone. ***Collectively addressing issues relating to El Niño*** events provides an opportunity for informal, multidisciplinary research before, during and after a project. An advisory committee – a collective of interdisciplinary professionals from modelling, policy-making and social science backgrounds (technical and non-technical) – could be established and work towards becoming permanent and continuous. This committee would be called on in advance of any impending El Niño event and this, in turn, would strengthen the bond of the committee.

Another suggestion was a possible year-long diploma targeted at non-modellers or persons pursuing governance degrees (***modelling for non-modellers, modelling for policy-makers, and public policy for scientists***).

In workshop settings, such as the Panama workshop, a role play activity was proposed where policy-makers can interpret model outputs, and modellers can identify decision-making needs.

3.4 Communities of practice

In the final main session of the workshop, discussion centred on communities of practice. Communities of Practice are broadly defined as groups of people who share an interest or a passion for something that they practice, and want to learn how to do it better through regular interaction. In order to do this they organize around a shared domain of interest and engage in joint activities, helping each other and sharing information. COP members are practitioners and not mere spectators – they actively test ideas, usually through a shared set of resources such as experiences, tools, metaphors, and ways of addressing recurring problems. Developing this sort of shared practice takes time, trust, and sustained interaction.[2]

Following on from a short COP presentation by Katharine Vincent, participants were asked to do small buzz groups at the table where they were seated and think about: "What do you think a community of practice could look like for this group, and what are the mediums we can use to take it forward?" A panel discussion followed where they provided ideas that were listed on a flipchart. Participants agreed that continued knowledge exchange between Asia and Latin America was important and came up with a variety of ideas of how this could be attained. Along with the more traditional output from a workshop – a synthesis paper which could possibly be published - participants were also keen to establish ***platforms for dialogues*** on which contending views could be shared, debated and a common understanding (if not agreement) could be reached. These platforms could include a presence on ***social media, a website and email distribution lists*** which could, where necessary, operate at different scales – across all members of various research teams or only around certain themes or topics – as well as ***Brown Bag seminars over skype or video conferencing***. Along with the virtual meeting spaces identified by the participants, ***real life interaction*** was also regarded as being an important way to encourage a COP. Participants further suggested more ***face-to-face meetings***, creating and ***working together on projects*** in the future and opportunities for members of other groups to share their knowledge at ***seminars and guest lectures***.

4. Next steps

4.1 Building a community of practice

Participants agreed that a community of practice would be important to continue sharing experiences from the CCW projects. A COP – particularly one that spans continents – requires time, effort and resources to be established and managed for optimal effectiveness. The most appropriate, low maintenance, mechanism for enabling a COP was deemed to be a Facebook page.

Various activities and outputs for such a COP were mooted. The importance of face-to-face meetings, to supplement virtual interaction, was highlighted. Given the resource-intensive nature of such meetings, clear, mutually agreed, goals are essential for success. Visits between members – to undertake research together or share knowledge (for example, through seminars) is another possibility. Published papers are a key mechanism for COPs to share their own experiences with wider audiences. Since writing teams with authors based in different countries can cause logistical challenges, writeshops may provide the space for collaboration and joint thinking.

4.2 Future commitments made by each project team

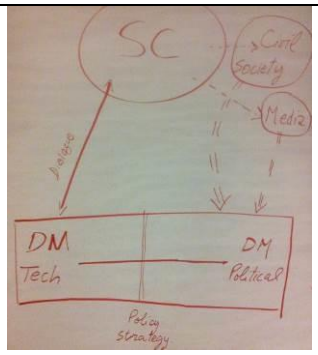
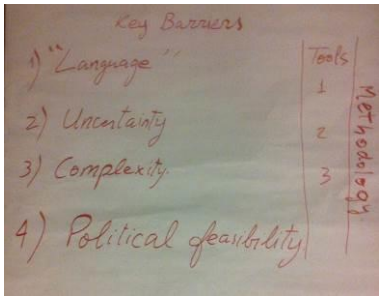
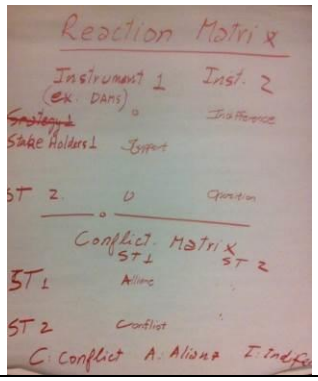
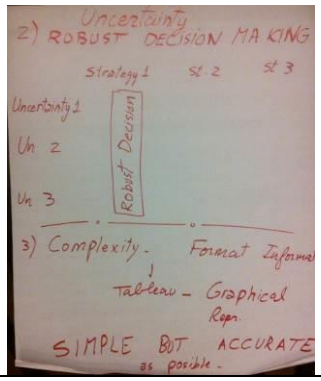
In order to address the oft-seen challenge of enthusiasm being usurped by routine activities and 'business-as-usual', the workshop closed with each project team discussing and committing to actions that they will take

[2] Cundill, G., Roux, D.J. and Parker, J.N., 2015, Nurturing communities of practice for transdisciplinary research, *Ecology and Society*, 20 (2): 22 Available online at http://dx.doi.org/10.5751/ES-07580-200222

forward in order to improve communication between PIs, policy-makers and modellers and build a community of practice. The commitments of each project group are listed in table 2.

Picture 4: Project team from Bolivia presenting their commitments

Project number	Country	Commitments
# 107088	**Cambodia**	• Produce an edited book on Climate Change and Water governance in Cambodia • Produce a 2 page policy brief for policy-makers • Conduct Dissemination workshop at provincial and national level
# 106591	**India**	• Decision Tools on WEA NEXUS (Sharing and pitching for adoption by government) • Promoting discussion on water sustainability issues (starting and coordinating 'sounding board') • Upscaling precision technologies (sensors and weather stations) • Co-operative societies & FPOs as Information Hubs • Agents of Change- Involving youth for sustainability • Web Portals
# 107085	**The Asian Highlands**	**Knowledge:** • Generate uncomfortable knowledge which has been ignored so far e.g. Spring, local water management **Reflection:** • Integrating/coping with surprises & dislocations e.g. April Earth Quake of 7.8 richter scale **Praxis (rethinking through engaging):** • Constructive engagements between researchers, government, advocacy groups, academic groups through existing and new platforms E.g. national (Dec), regional (March) Kunming, Pani Satsang
#107081	**Chile**	• Meeting General Directorate of Water - Visions (IWRM); MAPA 2.0 • Development of internal workshops • Climátics Mapo Platform • Mutual Necessities Assessment • Postgraduate dissertation
# 107083	**Guatemala, Nicaragua, Costa Rica**	• Portal (webpage) to facilitate access to hydro-climatic data for different target audiences at regional level • Capacity building courses and graduate school (feed national capacity building

		efforts) • Local Workshops/ Knowledge sharing meeting with local water companies adapted to local populations/ audiences • Policy interaction day involving high level decision makers • Beyond Scientific papers
# 107084	**Central America and the Caribbean**	• Work closely with the authorities and coordinate the transmission of messages to the communities, through the field workers of the ministries involved • To communicate the results in a simple way, and relating them to the interests of the beneficiaries; warning them on the importance and effects of modeled results • To elaborate simple communication instruments including drawings, figures and cartoons • To share all the results, methodologies and to give opportunities to facilitate the exchange of experiences
# 107098	**Bolivia**	• Elaborate a video/documental with results, didactically integrating climate/hydrological modelling • Bottom – up work to reinforce impact on the government • Display the scientific results on maps and educational graphics on the Altiplano Atlas • Disseminate the results within the diploma on transboundary waters and climate change instruments • Work on a proposal to develop a system of local indicators that strengthen the process of decision making
# 106714	**Peru**	• National Level: Participation in the ENFEN (El Niño committee) • Regional Level: Early warning system on floods • Local Level: Educational modules in the Mangrove (for artisanal extractors/ tourism)
# 107097	**Argentina**	   
# 107096	**Barbados, Jamaica**	• Carriacou Carnival Feb 2017 : represents an opportunity

	and Trinidad	• Calypso Comp- Climate theme • Kiddies Karnival – Climate costume (schools website) • We will engage with organizers: Opportunity to share project outputs through carnival preps; be available to work with those involved

/	**CARIAA**	• Science Policy Dialogue
		• Continuous engagements with stakeholders (including PM) (regional, national, sub national & local level). Taking up issues from bottom up.
		• Policy synthesis
		• Policy briefs
		• Open access to published results and other data – KMC
		• Assist policy planning
		  ○ Adaptation pathway
		  ○ Turning points
		  ○ hi.aware.org
		  ○ bcas.net
		  ○ teri.in.org
		  ○ icimod.org

Table 2: Project per project commitments to action

5. Conclusion

5.1 Science-society communication pathways

The workshop in Panama demonstrated that a foundation for a strong community of practice already exists amongst the PIs, policy-makers and modellers that attended. The three workshop sessions showed that there is broad agreement on what is wanted in terms of an ideal world for science-society communication pathways, and what is needed to get there. In addition, the discussions amongst, and between, the three sector groups highlighted the fact that there is recognition of, and respect for, the differences that exist between them in terms of how things are done and the priorities of each group. The sessions also emphasised that there is a strong willingness amongst all sector groups to embrace, change and see problems and issues from another's perspective. Yet it should be noted that while this was the experience with the group present at the workshop, it cannot necessarily be assumed that all scientists and policy-makers would be of the same opinion. It can be expected that the people who take the time out to attend such a workshop - especially policy-makers who are by no means obliged to do so - represent the people that already see the importance of engaging across the different sector groups.

Overcoming challenges related to funding, both for research and for implementation of solutions, as well as the shackles of research project time frames and government cycles were other aspects that came out strongly throughout the workshop. Conflicting time frames, the short term focus of government versus the more long term focus of climate change related research, was also a recurring theme.

Time, space and resources to engage across the three groups, and with that improved understanding of each other's working language, context, needs and limitations, were aspects that emerged as central to strengthening science-society communication pathways. This workshop provided one such space, and is ideally an initial foundation and stepping stone for continued interactions, within and between the project teams. Importantly, the session at the end of the workshop (in which participants were asked to come up with a list of actions that they will take forward in their projects) demonstrated that workshop participants had embraced the notion of setting up and maintaining a community of practice.

5.2 Evaluation

The results of the workshop evaluation are presented in full in Annex E. The workshop approach and structure was well received by the participants, with all rating it either good or excellent. Specific related comments included "very coherent and informative," "my expectations were exceeded," and "I congratulate them [organizers and facilitators] for the effort since I recognize that this is not an easy issue to deal with!"

There were mixed opinions on the success of the process. One participant noted that ”Starting of envisioning of ideal world to developing action plan of each country/organisation made was possible as different perspectives were captured and then translated it into action rather than just keeping it as dream.” However, facilitators and other participants noted that the process did not uncover the level of detail for which they had hoped. As highlighted by a participant there is a need to “go beyond the discussion of common problems and ideas which, in itself, is very interesting but it is a still a long way from solving the problems.” The facilitators found it challenging to get beyond the more generic and understood challenges such as “we work on different time frames,” and “we speak different languages” to uncover actual examples of overcoming challenges and successes from the projects. As outlined above, the expectation was that the barriers and subsequent wish list of the different groups (step 2 in the process) would yield quite detailed requests from one group to another, after which there could be a response and discussion between the groups that would start unpacking the details. Yet as shown above the sector groups came up with very similar wishes. Hence, for future workshops further thinking needs to go into what type of process would enable to really drill down to the very specific examples, barriers and subsequent wishes.

The role of policy-makers was central in the workshop process. One participant highlighted that “by having persons who are involved in policy matters it brought a new perspective to the discussions which was very valuable.” However, as noted by another it would have been good “having more policy-makers in the room.” A very pertinent challenge for workshops that bring together people of different backgrounds is ensuring that invitees are able to attend, particularly in the case of policy-makers. Whilst it is positive that six out of the ten policy-makers invited were actually present in Panama, most of them had strong scientific backgrounds and thus see the value of engaging with researchers and scientists. As highlighted here, the bigger challenge is ensuring the attendance of those without any scientific understanding, and/or those who do not see the value of research for policy-making.

Many participants observed that the presentation of tools and methodological approaches to deal with the communication issues discussed could have added further value to the workshop. Methodological approaches may not be readily available for bridging the knowledge gap between scientists and policy-makers, as this is still an emerging and evolving field. However “bring[ing in] creative people in communication” could potentially add a different angle, and provide some very specific skills for the group.

Overall, a few participants said that the workshop process enabled the group to meet the objectives “to a full extent”, while the large majority said “to a moderate extent.” Essentially, the workshop and its process provided an initial space for engaging across groups (PIs, modellers and policy-makers) and across projects and continents. It highlighted the similarities of issues across groups and projects and continents. Follow-on workshops could consider inclusion of more methodological input (to the extent possible), provision of tools and sharing of examples.

6. Annexes

Annex A: Workshop Agenda

(as per the outset of the workshop)

WORKSHOP AGENDA

Day 1	**Objectives: (1) Assess expectations, explain the workshop vision and goals and get to know each other** **(2) Visioning an "Ideal World," where understanding between policy/decision makers and scientists is possible and useful for both parties**
8:00-08:30	**Registration**
8:30-09:30	**Official opening and welcome** ▪ *Welcome by CATHALAC, IDRC & CSAG* ▪ *Official opening by the Honourable Emilio Sempris, Deputy Minister of the Ministry of Environment in Panama*
09:30-10:30	**Workshop introduction and scene setting** ▪ *Facilitators: presentation of programme and context* ▪ *Introductions: informal and interactive round of introductions* ▪ *Expectations: participants sharing expectations for the workshop* ▪ *Official workshop photograph*
10:30-11:00	**Tea break**
11:00-11:30	**Summary of first workshop**
11:30-12:30	**IDRC CCW projects** ▪ *Reflecting on communication and collaboration*
12:30-13:30	**Lunch**
13:30-14:45	**Visioning an "Ideal World" – Part 1** ▪ *Participants work in sector groups (modellers, policy makers, PIs) to create their vision of an ideal world, what the world would look like if scientists and policy/decision makers communicate easily and in ways that are useful for both parties – with report back and discussions in plenary*
14:45-15:15	**Tea break**
15:15-17:00	**Visioning an "Ideal World" – Part 2** ▪ *Participants work in mixed groups to take the sector group visions of an ideal world and create a common vision –with report back to plenary using a creative medium*
18:30	***Welcoming Dinner – Miraflores Visiting Center, Panama Canal***
Day 2	**Objectives: To understand current challenges by exploring the barriers that stand between the current reality and the "Ideal World"**
8:30-9:00	**Summary day 1 and objectives day 2** ▪ *Participant-led recap and facilitator –led overview of the coming day*
9:00-9:30	**Address by the Honourable José Alarcón Mella, Deputy Minister of Soil and Water, Dominican Republic**
9:30-10:30	**Hearings - Part 1**

- *Participants work in sector group stations to uncover obstacles to achieving the "ideal world" and agree on a wish list of what they need from each of the other groups in order to achieve the "ideal world"*

10:30-11:00 **Tea Break**

11:00-12:30 **Hearings - Part 2**

- *Each group rotates to the other two stations, look at the wishes others have of them, discusses them and tries to answer what they can provide, what they could partly provide or couldn't provide and reasons*
- *Reflections on the hearings exercise*

12:30-13:30 **Lunch**

13:30-14:00 **The Communication Gap**

- *Synthesizing the route of seasonal forecast from producer to end user, and reflecting on how that mirrors the actual process*

14:00-14:45 **Categorizing challenges and barriers**

- *Using the previously-mentioned obstacles (hearings part 1), get participants to mark their top 3, and then categorize these into "things we can control/work on", "Things we can influence" and "Things we can do nothing about".*

14:45-15:15 **Tea Break**

15:15-17:00 **Unpacking challenges and barriers**

- *In mixed groups discuss ways of overcoming the previously-mentioned obstacles (hearings part 1)*

Day 3 **Objectives: To identify which of the listed barriers can be overcome/modified and the steps required to get as close as possible to the envisioned "Ideal World"**

8:30-9:30 **Summary day 2 and objectives day 3**

- *Participant-led recap and facilitator –led overview of the coming day*

09:30-10:00 **Communication Challenges**

- *Imitating competitive buyers' negotiations, and reflecting on communication in the context of competition/reaching common goals*

10:00-11:00 **Moving towards an "Ideal World"**

- *Plenary discussion to link reality with the vision of a perfect world, created on the first day. Build on all preceding sessions. Facilitators will steer discussion along the lines of "how can we build on the discussions and lessons learned here?" and ensure that there is a discussion around the next steps*

11:00-11:30 **Tea Break**

11:30-13:00 **Closing**

- *Revisiting expectations: looking at the expectations listed on day 1, and reflect on whether they have been met and what participants feel they have learnt*
- *Next steps: Ask each participants to identify at least one thing they will do as a result of this workshop*

13:00-14:00 **Lunch**

Climate System Analysis Group

IDRC | CRDI Canada

CATHALAC
CIENCIA, EDUCACIÓN Y POLITICAS PARA LA GENTE

PROJECT AND PARTICIPANT INFORMATION

International Workshop

ADVANCING THE APPLICATION OF CLIMATE AND HYDROLOGICAL INFORMATION AND ITS TRANSLATION INTO POLICY

Taller Internacional

PROMOVIENDO LA APLICACIÓN DE LA INFORMACIÓN CLIMÁTICA E HIDROLÓGICA Y SU TRADUCCIÓN EN LAS POLÍTICAS

Ciudad de Panamá, República de Panamá

6 - 8 de octubre de 2015

Introduction

The workshop brings together principal investigators (PIs) and researchers (modellers) from projects supported by the IDRC Climate Change and Water (CCW) programme, as well as policy makers and planners working in the project localities. Teams from 11 different IDRC projects are participating at the workshop, each with either two or three participants, depending on whether PIs, researchers (modellers) and policy makers and planners were available to attend.

This document provides a brief introduction to each of the projects and the biographies for each of the workshop participants related to that project, as well as the biographies for all the workshop organisers present (funders, coordinators & facilitators).

#1: Improving Water Governance and Climate Change Adaptation in Cambodia (project # 107088)

Geographic focus: Cambodia

Project partners:

Cambodia Development Research Institute (CDRI) (lead) in partnership with five key government and academic institutions and one regional network:

- Ministry of Water Resources and Meteorology
- Ministry of Environment and the Secretariat of Inter-ministerial Committee for Climate Change
- Tonle Sap Authority
- Institute of Technology of Cambodia
- Royal University of Agriculture
- The Mekong Program on Water, Environment, and Resilience

Project description:

Cambodia's Tonle Sap Lake is the largest freshwater lake in Southeast Asia. It is estimated that up to half of Cambodia's population benefits directly or indirectly from the lake's resources. Over the next few decades, climate change and new hydroelectric development will likely alter the lake, negatively affecting livelihoods. This project will study these changes and integrate findings into Cambodia's policy and planning framework.

To better understand the implications of both climate change and development on livelihoods in the basin, researchers will first assess gaps in existing research on the water-related impacts of climate change and make recommendations to improve future studies. The project will also undertake research on hydrological change in three sub-catchment areas in the Tonle Sap basin.

It is expected that this research will make a substantial contribution to improving local and provincial adaptation planning initiatives in Cambodia.

Sam Sreymom

Acting head of environment unit of Cambodia Development Resource Institute (CDRI)

Email: sreymomsam@yahoo.com

Ms Sam Sreymom is currently is an acting head of environment unit of Cambodia Development Resource Institute (CDRI). She has been leading and published many research projects related to climate-smart agriculture, natural resource governance, climate change adaptation and vulnerability, and disaster risk management and reduction. In the IDRC Climate Change Water project, she is now leading two main components including vulnerability assessment and water governance.

Dr Sarann Ly

Head of Department Rural Engineering at Institut de Technologie du Cambodge (ITC)
E-mail: ly.sarann@gmail.com

Dr Sarann Ly is a lecturer/researcher in the field of Water Resources Engineering/Management and Head of Department Rural Engineering at Institut de Technologie du Cambodge (ITC). He is also involved with many development and research projects with government institutions, NGOs and private companies in the field of geospatial and water/natural resources management. Dr Ly's academic background is in the field of hydrological modelling and hydrometeorology, more specifically in the estimation of spatio-temporally resolved rainfall as in put for hydrological modelling. He has developed several types of complex geostatistical interpolation algorithms applied to rainfall. Dr Ly has been working as a leader, team leader and coordinator of various development and research projects related to water resources engineering and environmental studies. He is currently the ITC team leader (partner of CDRI) of the "improving water governance and climate change adaptation in Cambodia" project.

Dr Heng Chan Thoeun

Deputy Director of Climate Change Department, Ministry of Environment
Email: hcthoeuncc@gmail.com

Dr Heng Chan Thoeun has been involved in climate change activities in Cambodia since 1999 to present, including preparation of the NAPA and the Vulnerability and Adaptation Assessment under the Initial and Second National Communications to the UNFCCC. Furthermore; (i) Preparation of a Strategic Pilot Program for Climate Resilience Phase I in Cambodia; (ii) Cambodia Climate Change Alliance Trust Fund team leader: Call for Proposals adaptation project focus on Agriculture, Forestry, Fisheries, Water resources, Meteorology, Health and Infrastructure; (iii) Team Leader for Conducting Field Survey at Provincial Level on V&A Assessment; (iv) Capacity Building Technical Assistant for Capacity Building for the Clean Development Mechanism Project; (v) Farm Conservation and Sustainable Use of Cereals Diversity through Participatory Plant Breeding and Securing Local Seed Systems in Climate Vulnerable Provinces of Cambodia; (vi) Climate Risk and Impact Assessment for Forest-Based Adaptation Planning in Cambodia "Historical Climate and Future Climate Projections; (vii) Baseline Study on Climate Forecasting for Community Protected Areas; (viii) Deputy Head of Trust Fund Secretariat for CCCA-1 program and Team Leader for the Result3 of Knowledge Management-CCCA-2; (ix) Lead Expert of MoE Team of Climate Change and Water Governance in Cambodia Project, CDRI, and in charge of vulnerability and adaptation assessment, and NAP process.

#2: Food and Livelihood Security in Punjab through Water, Energy and Agricultural Management (project # 106591)

Geographic focus: India
Project partners:

- Centers for International Projects Trust (CIPT)
- Columbia University
- Punjab Agricultural University

Project description:
This project aims to engage farmers, corporations and the state agricultural extension program in making better use of meteorological information to optimise water and energy use, and reduce

pressure on overexploited aquifers. While previous work has targeted higher income farmers, this work will focus on lower income groups.

Researchers will assess the vulnerability of the food production system to water scarcity; use seasonal climate forecasts to guide irrigation scheduling, fertilizer application and crop choice; optimize the use of agricultural technology to improve water use efficiency; and make use of mobile phone technology to facilitate an exchange of information between farmers and planners. The project is expected to result in policy recommendations aimed at promoting sustainable resource management and facilitating access to resources by low-income farmers.

Dr Kamal Vatta
Director of Centers for International Projects Trust (CIPT)
Email: kmlvatta@yahoo.com

Dr Kamal Vatta is the Director of Centers for International Projects Trust (CIPT), New Delhi. In his capacity as Director he is responsible for leading CIPT team and guiding in areas of research, advocacy, administration, networking and building partnerships.

Prior to joining CIPT, Kamal worked at Punjab Agricultural University (PAU), Ludhiana. His research focus has largely been on economic aspects of natural resource degradation (especially water), climate change and its impact on agriculture and the role of rural labour markets in rural development.

He has published more than 60 research papers in the peer-reviewed journals and completed 20 research projects. He was the co-PI of the project titled 'Food and Livelihood Security in Punjab through Water, Energy and Agriculture Management' funded by the International Development Research Center (IDRC), Canada.

He has a Ph.D in Agricultural Economics from PAU and has advanced diploma in Agricultural Research for Development from the International Center for Development oriented Research in Agriculture (ICRA), Wageningen, The Netherlands.

Garima Taneja
Senior Research Associate at Centers for International Projects Trust (CIPT)
Email: garima@cipt.in

Garima Taneja is working as a Senior Research Associate at Centers for International Projects Trust (CIPT), New Delhi. She has almost four years of work experience in agricultural and development research. Prior to joining CIPT, she was working at International Food Policy Research Institute (IFPRI), New Delhi.

Garima Taneja has been working on areas such as climate-smart interventions and agriculture, impact assessment of capacity building programs and development of an index on status of agriculture in Asian countries. She has contributed to various discussion papers, project reports and presented work at different seminars/conferences.

Her expertise lies in conducting participatory rural appraisals, analyzing data and cost-benefit analysis. Her areas of interest include agricultural, environment and development economics. At CIPT, she is developing a Water-Energy-Agriculture Nexus model, by estimating the demand and supply of water & energy within agriculture, industry and domestic sectors.

#3: Building Effective Water Governance in the Asian Highlands (project # 107085)

Geographic focus: The Asian Highlands (Nepal, Pakistan and China)
Project partners:

- Swiss Association of International Cooperation
- Kunming Institute of Botany

Project description:
This project seeks to facilitate effective water resource management in the Asian Highlands by integrating climate change impact analysis with assessments of vulnerability, livelihood options, and water policy.

Researchers at the Kunming Institute of Botany in China will develop regional bioclimatic maps and model climate scenarios to predict climate change impacts in the Asian Highlands. HELVETAS Swiss Inter cooperation will partner with the Kunming Institute to assess vulnerability and capacity to adapt to climate change in select communities in Nepal and Pakistan, while the Institute will lead vulnerability assessments in China.

These case studies, coupled with climate data and an analysis of water policies, customary rights, and water management practices, will form the basis for local and regional shared-learning dialogues. The project will also look at the interaction between key stakeholders, the distribution of risks and benefits, and the negotiation of outcomes.

Mona Sherpa
Deputy Country Director of HELVETAS Swiss Intercooperation Nepal
Email: mona.sherpa@helvetas.org.np

Mona Sherpa is a feminist and sociologist by her academic background and practice. She functions as Deputy Country Director of HELVETAS Swiss Intercooperation Nepal. She has experience with different other I/NGOs like ActionAid International Nepal, Room to Read and Vision Nepal. She has worked with ActionAid International Nepal for last 8 years as Knowledge, policy and campaign manager and through that engaged with people's movement, campaigns, policy work and different small and large studies. She has been part of women's movement and human rights movement and is also engaged in various policy processes being part of governmental committee. Her engagement with Kamaiya(bonded labour) movement for rights and rehabilitation, women's rights to land movement and rural women's movement is still there through different committees and networks. She is also a core member of SANGAT i.e. South Asian Feminist Network. Her involvement in some action research related to unpaid care work and safe cities is widely commended and has also written articles on the issue in both global journals like Gender and Development Journal and national like Ashmita (Nepali feminist magazine) and different daily papers. She is also a children story writer and has published a book named 'Sani ra Pari' on the importance of libraries and building self-exploratory study habit in children.

At present in the capacity of Deputy Country Director, Ms. Mona is the management point for the Building Effective Water Governance in Asian Highland (BEWGAH) project. Her responsibility is to give direction to the team aligning with the Country Strategy of HELVETAS Swiss Intercooperation Nepal along with ensuring timely operations of the project with strategic direction. She also supports the team in national policy advocacy with the use of data and experiences generated through the project, along with support to collaborate with like-minded organizations and other existing internal projects of HELVETAS Swiss Intercooperation Nepal.

Dipak Gyawali
Academician of the Nepal Academy of Science and Technology (NAST) and Chair of the non-profit Nepal Water Conservation Foundation
Email: dipakgyawali@ntc.net.np

Gyawali is currently *Pragya* (Academician) of the Nepal Academy of Science and Technology (NAST) and Chair of the non-profit Nepal Water Conservation Foundation as well as that of private research firm Inter Disciplinary Analysts. He has been conducting interdisciplinary research on the interface between technology and society, and has published numerous articles on the topic of water, energy, dams, and climate change issues. A Moscow-trained hydroelectric power engineer and a University of California at Berkeley-trained political economist, he has initiated reforms in the electricity and irrigation sectors during his time as Nepal's Minister of Water Resources in 2002/2003.

Gyawali has been involved, inter alia, as guest scholar and researcher at various institutions such as the Queen Elizabeth House in Oxford and the United Nations University in Yokohama as UNESCO visiting professor of water and cultural diversity. He has also served as a member of several panels and steering committees, such as the panel of experts for the Mekong River Commission, the steering committee of the Mekong Program on Water, Environment and Resilience (MPower) and he is currently vice-chair of the Technical Advisory Committee of UNESCO's World Water Assessment Program. He currently also serves on the advisory board of several civic organizations such as Biogas Support Program, National Association of Community Electricity Users Nepal etc.

Gyawali's current research interest is the society-technology interface, and he has published extensively in Nepal and internationally.

#4: Vulnerability and Adaptation to Climate Variability and Change in the Maipo Basin, Central Chile (project # 107081)

Geographic focus: Chile
Project partners: Centre for Global Change ,Catholic University of Chile (PUCC)

Project description:
A climate change adaptation strategy for the Basin is a priority for the Chilean Ministry of Environment. To support the development of such a strategy, this project will conduct comprehensive research led by the Centre for Global Change at the Pontificia Universidad Católica de Chile, in collaboration with local and international researchers.

The team will use simulation tools to estimate future water availability and quality to see who is most vulnerable and which sectors are most exposed. Based on this analysis, the team will propose adaptation options under different water supply and demand scenarios. The project will also address the recurrent problem of land competition, as urban sectors encroach on rural territories, challenging institutional capacities and plans for managing Latin American metropolitan regions.

The team will conduct training courses for policymakers and technicians in other Latin American countries and disseminate results widely, including in international peer-reviewed journals. This project is expected to position Chile's Centre for Global Change as a regional centre of excellence able to aid adaptation planning in similar river basins.

Sebastian Vicuña D.
Executive Director UC Global Change Center, Catholic University of Chile (PUCC)
Email: svicuna@uc.cl

Sebastian is the Executive Director of the UC Global Change Center, a research center in the Catholic University of Chile. His research areas of interest are related to climate change, water resources, hydrologic modelling, and integrated watershed management. Sebastian is the lead author of the IPCC Fifth Assessment Report in the chapter on Impacts of Climate Change in Central and South America; and coordinator and lead author of the Second Assessment Report on Climate Change and Cities (ARC3-2) in the chapter on Water and Sanitation Systems and Editor for the IPCC Special Report on climate change and extreme events in the chapter of impacts.

Sebastian is a Civil and Environmental Engineer from the Catholic University of Chile, in 2004 he obtained a Master degree in Public Policy and a Master in Civil and Environmental Engineering from the University of California, Berkeley. In 2007 he obtained his PhD in Civil and Environmental Engineering from the same university**.**

Eduardo Bustos
Research Associate UC Global Change Center, Catholic University of Chile (PUCC)
Email: efbustos@uc.cl

Eduardo Bustos is an agronomist M.Sc., Research Associate at the Center for Global Change at the Pontifical Catholic University of Chile. He participates as a researcher in the MAPA project in the development of WEAP modeling tool for the study basin (Maipo River basin, Chile) and the development and use of climate change scenarios for impact assessment in the hydrology and the water users in the basin, including hydropower generation, water services and agriculture.

In addition, and given the need to improve the processes of dissemination and transfer of knowledge generated in this type of research to diverse audiences, he has implemented the communication strategy of the MAPA project, and has also started graduate studies in the area of Social Communication, specialty in Communication and Education.

Adrian Lillo
Chief of the Division of studies and planning, Dirección General de Aguas (DGA) of Chile
Email: adrian.lillo@mop.gov.cl

Adrian Lillo Zenteno, Civil Engineer. For 15 years he has been working in Dirección General de Aguas (DGA) of Chile (The water agency in Chile). Since 2012 he has been the Chief of the Division of studies and planning. Adrian Lillo Zenteno's main areas of work are: evaluation of water sources, water resources planning related to the administration of water resources. The work includes the coordination and development of studies and projects related to water sources, their availability and their hydrological and hydrogeological processes, as well as the development of plans and strategies for management of water at the territorial level.

Adrian Lillo Zenteno's main interest in this workshop is to know how to incorporate in public policy issues the criteria or information about climate change projections. The DGA is involved in the IDRC project "Vulnerability and adaptation to the variability and climate change on the basin of the river Maipo in Central Chile".

#5: Adapting Community-Based Water Supply in Central America to a Changing Climate (project # 107083)

Geographic focus: Guatemala, Nicaragua and Costa Rica
Project partners:

- Tropical Agriculture Research and Training Center (CATIE)

Project description:
This research project will study the effects of climate change on water availability in Central America. Researchers will investigate how community-based water organizations in Guatemala, Nicaragua, and Costa Rica are adapting to the changes. They will also:

- Assess how water suppliers can adapt their practices to safeguard water
- Inform climate change adaptation policies for community-based water supply organizations
- Map the impact of climate change to define key areas of study at the regional level
- Identify and evaluate the factors that help these organizations adapt to extreme precipitation and droughts
- Assess the incentives and restrictions that influence decisions to invest in climate change adaptation actions
- Develop design guidelines and criteria to help prioritize climate change adaptation investments
- Build local capacities through training courses
- Disseminate results at the local, national, and international levels.

This research will help support community-based drinking water organizations, which are generally small, nimble, and able to respond to priority needs more effectively than larger utilities in Central America. Case analysis from Costa Rica will be used to assess useful adaptation options. Using this analysis as a base, the team will conduct a survey of households and water providers from all three countries and focus on assessing the costs and benefits of different adaptation measures. The results are expected to help improve decision-making and better guide private and public adaptation investments to secure water supply for rural and peri-urban residents.

Dr Róger Madrigal-Ballestero
Investigador y docente para CATIE (Centro Agronómico Tropical de Investigación y Enseñanza)
Email: rmadriga@catie.ac.cr

Ph.D, Environmental Economist. Currently works as a researcher and professor for CATIE (Tropical Agriculture Research and Training Center) in Costa Rica. His main areas of academic interest are related to community management of natural resources, adaptation to climate change and water resources governance. Currently he is one of the principal researchers of the project "Water, Communities and Climate Change in Central America" funded by IDRC. Among the main responsibilities he has in this project is the development of a diagnosis of adaptive capacity to drought scenarios by community organizations of domestic water services in rural areas of Nicaragua, Guatemala and Costa Rica.

Dr Pablo Imbach
Affiliate with the Tropical Agriculture Research and Training Center (CATIE)
Email: pimbach@catie.ac.cr

Pablo Imbach has over fifteen years of experience working in Latin America, which started as a GIS specialist working for conservation NGO's on development oriented aid and environmental conservation. His work has

shifted during the last six years to scientific research on the biophysical aspects of climate change, biodiversity conservation and ecosystem services. He has extensively made use of modeling tools at different geographical scales for land use change, hydrology, ecosystem dynamics, atmospheric monitoring, species modeling and climate change assessments. He has coordinated and participated in several interdisciplinary research groups and capacity building activities, including technical support to institutions and organizations at the local, national and regional levels. He has been affiliated to CATIE's Climate Change & Watersheds Program since 2005, where he has created and currently leads an interdisciplinary group focused on research and technical assistance for ecosystems and global change issues, through the use of modeling tools. He holds a PhD in Environmental Sciences from the Laboratory of Soils, Climate and Environment (LSCE) at the University of Pierre Marie Curie in Paris.

Luis Gámez
Researcher, Research & Development Department of the Public Utilities Company of Heredia (ESPH) in Heredia, Costa Rica
Email: lgamez@esph-sa.com / gamezch@racsa.co.cr

Luis Gamez is currently staff member of the Research & Development Department of the Public Utilities Company of Heredia (ESPH) in Heredia, Costa Rica. At the ESPH, he has been Director of the Environmental Management Office where the design, implementation development of a creative green fee in the water service fee and a local scheme of a Payment of Watershed Services Program become a major feature. Other related work has been establishing PES component for hydropower generation projects and a green fee for sewage. Mr. Gamez is M.A. in Anthropology and Natural Resources Management from the University of California. Among his professional experience, he has occupied positions as Research professor in Ecological Economics Program at Universidad Nacional in Heredia , Costa Rica 1994-2002 ; advisor in Environmental Services to the Ministry of Environment of Costa Rica 1997 -2001, and as international consultant for UNESCAP in environmental services payment policy in Viet Nam and Aceh, Indonesia, for USAID in assisting a pilot PES in local government in Panama, World Bank, InterAmerican Development Bank, UNDP and others.

#6: Water Security and Climate Change in Central America and the Caribbean (project # 107084)

Geographic focus: Central America and the Caribbean
Project partners:

- Water Centre for the Humid Tropics of Latin America and the Caribbean (CATHALAC) (Lead)
- University of San Carlos in Guatemala
- Technological Institute of Santo Domingo, Dominican Republic

Project description:

This project will help Central American and Caribbean countries enhance water security and inform investment in climate change adaptation actions. It will also strengthen municipalities' capacities to address climate change.

The project team will identify key climate change stressors, and also map and assess the seasonal vulnerability of water resources at the regional level. It will also investigate how policies can affect local vulnerabilities to climate change, using four pilot watershed municipalities in Guatemala and the Dominican Republic.

Findings will be synthesized in a set of recommendations for policymakers on how to incorporate climate change adaptation into investment policies addressing water security at the local level. Results will be shared through peer-reviewed publications, university online training courses in

Guatemala and the Dominican Republic, and an open-access database of future adaptation policies for the river basins of Central America and the Caribbean

Dr Freddy Picado
Director General, Centro del Agua del Trópico Húmedo para América Latina y el Caribe (CATHALAC)
Email: Freddy.picado@cathalac.int

Freddy Picado is the Director General of the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC), an international organization established in 1992 in the Republic of Panama, dedicated to promote sustainable development in Latin America and the Caribbean through applied research, education and technology transfer in the area of watershed management, climate change, environmental analysis and modelling and risk management. His research interests are related to climate change, climate modelling, vulnerability assessment of the human and natural systems and designing adaptation plans and strategies.

Freddy is lead author of two national communications of Nicaragua and the Second National Inventory of GHG of Panama. He has worked as a leading expert in six climate change projects, two regional (Central America and the Caribbean) and 4 national (EU, UNDP-GEF, UNEP, IDRC). He has participated in more than 20 publications on climate change as main editor or Co-author. Negotiator to the UNFCCC. Freddy is the Director of the regional project Water Security and Climate Change in Central America and the Caribbean funded by IDRC.

Freddy is a Civil Engineer from the National Autonomous University of Nicaragua, meteorologist from the National Institute of Meteorology of Spain (1982) and holds a doctorate in Geography with an emphasis on applied meteorology from the Hydrometeorological Institute in Odessa, Ukraine (ex – USSR, 1989)

Miroslava Morán
Especialista en Recursos Hídricos y Educación, Centro del Agua del Trópico Húmedo para América Latina y el Caribe (CATHALAC)
Email: miroslava.moran@cathalac.int

Miroslava Moran, currently works as Water Resources and Education Specialist at CATHALAC. Miroslava leads the technical coordination of the regional project Water Security and Climate Change in Central America and the Caribbean funded by IDRC.

She has vast expertise in the field of natural resource management, watershed management, integrated water resources management (IWRM), community development and project design. She has also directed numerous presence and on- line educational programs such as the Regional Diploma in IWRM, and trained dozens of professionals from the continent, as well as developed programs for teachers, specialized courses on watersheds for the Panama Canal Authority and the Ministry of Environment of Panama. Miroslava Moran is an Environmental Engineer, has a Masters in Science in Management and Conservation of Tropical Forests and Biodiversity and a Masters in Environmental Education.

Octavio Smith
Investigador Principal Centro del Agua del Trópico Húmedo para América Latina y el Caribe (CATHALAC)
Email Octavio.smith@cathalac.int

Octavio Smith is a professional geographer and holds a master degree in Economics, with a Specialization on Evaluation, Development and Management of Projects from the University of Panama.

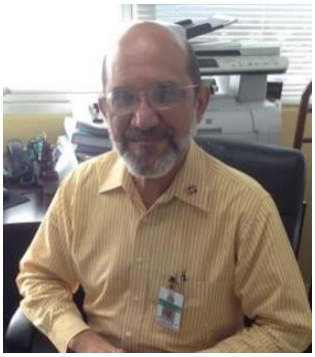
Octavio has served as a consultant in Geomatics in the National Plan of Water Resources of Panama and has worked as a geographer in the area of Urban Development in the Ministry of Housing of Panama; worked as Specialist in environmental land planning and management in the National Environmental Authority of Panama (MIAMBIENTE); and as Professor of Economic Assessment, Social and Environmental Impact in the Research and Graduate Faculty of Economics of the University of Panama.

Octavio has extensive experience in environmental modelling, applying Geographic Information Systems and Remote Sensing tools and developing management tools related to: Urban Planning, Environmental Impact Assessment, Environmental Land Management, Rural Cadastre, Urban Cadastre, Planning, Demarcation of Protected Areas and Environmental Education.

With CATHALAC since 2005 as principal researcher and professor for the Diploma in Integrated Water Resources Management (CATHALAC/United Nations University) and several specialized GIS and remote sensing courses.

Currently he is involved in the regional project Water Security and Climate Change in Central America and the Caribbean funded by IDRC, where he has participated in hydrological modelling of the Yaque del Sur Watershed in the Dominican Republic and the Samalá Watershed in Guatemala.

José Alarcón Mella
Viceministro de Agua y Suelos, Ministerio de Ambiente y Recursos Naturales de República Dominicana.
Email: jose.alarcon@ambiente.gob.do



Mr. Alarcón Mella, is an Agronomist Engineer; Specialist in Renewable Natural Resources Management with emphasis on Watershed Management; Environmental Land Management with emphasis on Prevention, Mitigation, Disaster Response and Risk Management at the Municipal level among other specialties.

He has worked as a private consultant in Land and Water Development, Environmental Management, Risk Management, Land planning Management, Food Security and Participatory Planning for Protected Areas from 1982 to date.

He has teaching experience at the Autonomous University of Santo Domingo, in the Faculty of Agronomy and Veterinary Sciences, Department of Agronomy, during the period of 1982 to date, teaching subjects such as: Soil Genesis, Soil Science, Applied Hydraulics, Irrigation and Drainage, Soil Conservation, Watershed Management, Risk Management.

From September 2, 2012 he was appointed Deputy Minister of Land and Water of the Ministry of Environment and Natural Resources.

#7: Strengthening Local Capacity for Adaptation to Climate Change in the Bolivian Altiplano (project # 107098)

Geographic focus: Bolivia
Project partners:

- Centro de Apoyo a la Gestión Sustentable del Agua y el Medio Ambiente "Agua Sustentable"

Project description:
This project aims to build the capacity of communities in Bolivia's Central Highlands to adapt to water-related impacts of climate change by identifying the most viable adaptation options. To improve the evidence on climate change and its impacts on water, researchers will develop downscaled climate scenarios for the region.

These scenarios will include estimates of future changes in precipitation, evaporation, and water flows from Lake Titicaca, the main water reservoir in the Bolivian Altiplano. Researchers will then couple these scenarios with hydrological models and projected trends in land use and agriculture to identify the areas and populations most vulnerable to water-related climate change.

The government of the province of Oruro has expressed an interest in pioneering adaptation plans and has already endorsed the project. It is expected that the research will guide the provincial government's planning and investments, including the allocation of potential international adaptation funds.

Paula Pacheco Mollinedo
Director, Centro de Apoyo a la Gestión Sustentable del Agua y el Medio Ambiente "Agua Sustentable"
Email: paulis.pacheco@gmail.com

Directora Regional del Centro de Apoyo a la Gestion Sustentable del Agua y el Medio Ambiente "Agua Sustentable". Posee una maestria en Ingenieria en Recursos Hídricos en la Universidad de Lovaina, Bélgica. Sus actividades se centran en investigación y coordinación en adaptación al cambio climatico y cuencas transfronterizas, linea en la cual se centra el actual proyecto financiado por el IDRC.

Jorge Molina Carpio
Researcher at the Institute of Hydraulics and Hydrology, University of San Andres, La Paz
Email: amolina@umsa.bo

Jorge Molina is a researcher at the Institute of Hydraulics and Hydrology (IHH) of the University of San Andrés of La Paz, Bolivia. He is a former Director of the Institute. He is also lecturer at that University and other Bolivian universities. Currently he is in charge of programs in the following areas: water resources assessment, hydrologic cycle variability and trends, water resources management (with emphasis in international basins) and environmental impact assessment of hydro projects. J. Molina has experience in: Hydrology and variability of the hydrological cycle, design of hydraulic works, water resources models and water management plans at the basin level and Environmental impact assessment of water projects. From 2013, J. Molina has worked on the project "Strengthening Local Capacity for Adaptation to Climate Change in the Bolivian Altiplano", as a hydrologist and responsible of the water management model setting. He has worked in IDRC funded projects since 2002.

#8: Impacts of Climate Variability and Climate Change on the Mangrove Ecosystem in Tumbes, Peru (project # 106714)

Geographic focus: Peru
Project partners:

- Instituto Geofisico del Peru (IGP)

Project description:
This project aims to improve understanding of the ecosystem so that its human population can prepare effectively for the impacts of climate variability. Researchers, in cooperation with community associations, local authorities and other stakeholders, will document the impact of climate variability on the ecology and sustainability of the mangrove ecosystem, investigate the sensitivity of the black conch (Andara tuberculosa) and other species to changing salinity and sediment levels, and assess the economic value of environmental services provided by the mangrove ecosystem.

The project is expected to lead to the development of an adaptation plan for the mangrove ecosystem and local communities, including a concerted sustainable management plan for the extraction of the black conch. Given the importance of mangrove ecosystems to coastal areas throughout the world, this research has the potential to make a contribution to adaptation efforts by coastal communities beyond Peru.

Alejandra Martínez

Director of the Society and Geophysics group at the Geophysical Institute of Peru (IGP)
Email: alejandra.martinez@igp.gob.pe

Alejandra Martínez is an economist with a Master's degree in Ecology and Environmental Management. She is currently Director of the Society and Geophysics group at the Geophysical Institute of Peru; where the various aspects of the human dimension linked to geophysical phenomena are developed, and how this information is communicated to society.

She is also an associate research scientist in charge of the socioeconomic aspects in projects linked to vulnerability and adaptation to climate change, for example in the "Impact of climate variability and change in the mangrove ecosystem of Tumbes – Peru" project.

Recently, Alejandra Martínez's research has focused on understanding the link between artisanal extraction of aquatic resources and the impacts of climate variability and climate change in the northern Peruvian coast; and how this information can be use in local, regional and national management and planning.

Ricardo Zubieta

Research associate, Department of Atmospheric and Hydrospheric Sciences at the Geophysical Institute of Peru (IGP)
Email: ricardo.zubieta@igp.gob.pe / rdo.zubieta@gmail.com

Ricardo Zubieta is a research associate in the Department of Atmospheric and Hydrospheric Sciences at the Geophysical Institute of Peru-South America, PhD (c) in Water Resources. He received his Msc.D. in 2013 from the Agraria University of Peru, and he has specialization on satellite imagery processing at the Polytechnic University of Madrid-Spain. Ricardo Zubieta's research is focused on hydrological modeling using satellite-based precipitation over Amazon basins.

He is currently using ground-based precipitation and remote sensing to analyze concentration of daily precipitation over Andean regions. Moreover, Ricardo Zubieta's current research interests lie in the use of remote sensing and geographic information science (GIScience) techniques to study the hydrology and Hydrodynamic of the Amazon basin.

#9: Adapting to Water Stress in the Comahue Region of Argentina (project # 107097)

Geographic focus: Argentina
Project partners:

- Fundación Bariloche

Project description:
This research will assess water availability and demand to support the development of strategies to help the region's diverse water users adapt to expected future water scarcity. It will aim to develop new knowledge and strengthen local capacity to design public policies that enhance sustainable management of scarce water resources. Specifically, the project will:

- Document the factors that influence water availability, quality, and distribution
- Generate local and regional climate and hydrological models and scenarios for mid- and long-term water availability
- Assess current water availability, use, and distribution in sub-regions of the Comahue and provide projections for the next five decades
- Identify water stress critical vulnerability hotspots where adaptation efforts could be focused
- Help local communities and authorities develop adaptation plans to cope with reduced water availability and implement recommended adaptation strategies
- Support authorities and institutions in developing public policies that enhance sustainable water resource management.

Researchers will use downscaled climate models, hydrological and energy models, detailed land cover maps, and agricultural and census data to understand current and predicted water availability in the Comahue region. They will work closely with key actors including municipal governments, agricultural producer associations, oil companies, hydroelectricity providers, and community organizations.

The project will generate maps to identify vulnerability hotspots that should receive priority support for adaptation. The research will inform policy recommendations for municipal and provincial institutions involved in water management in the Comahue. It will also contribute to related policies at the national level. The project will help design and validate local adaptation plans in two selected hotspot case study sites. Researchers will implement adaptation actions proposed by the communities and assessed through detailed cost-benefit analysis.

Gustavo Nadal
Researcher, Bariloche Foundation
Email: gnadal@fundacionbariloche.org.ar

Gustavo Nadal has a degree in physics, graduated from the Institute of Physics Dr. Balseiro in SC Bariloche, Province of Rio Negro. He also holds a master in Environmental Technology from the Imperial College of London, UK. Gustavo Nadal is a researcher of the Bariloche Foundation, focused on the evaluation of

renewable resources and technologies, the identification of barriers and opportunities for dissemination, and the formulation of recommendations and policy guidelines.

He is also involved in regional water requirements assessment (WEAP) and GHG emissions in the energy sector. Gustavo Nadal is a co-coordinator for the Climagua project – Adaptation to water stress in the Comahue region – Argentina, financed by IDRC.

Dr. Ines Camilloni
Professor at the Department of Atmospheric and Oceanic Sciences, University of Buenos Aires
Email: ines@cima.fcen.uba.ar

Dr. Camilloni's areas of expertise includes regional climate variability and change, evaluation of climate models from CMIP3 and CMIP5 and regional climate scenarios for impact assessments.

She was lead *author* of IPCC-WG1 AR5 Chapter 11: *Near-term climate projections and predictability* (2010-2013), as well as of the Third National Communication of Argentina to the UNFCCC *(*2013-2014). Dr Camilloni was a participant (poster presenter and invited presentation) at the IPCC Workshop on Regional Climate Projections and their Use in Impacts and Risk Analysis Studies in 2015.

In the project "Adapting to Water Stress in the Comahue Region of Argentina" Dr Camilloni is responsible for the development of knowledge and capacities for the design of public policies oriented to the preparation of adaptation plans to water stress in the Comahue region (Argentina).

Fernando Tomás Losano
Neuquén, Limay and Negro Basins Authority (AIC)
Email: flosano@aic.gov.ar / losanofernando@gmail.com

Since 1993, Fernando Tomás Losano has been working at AIC (Neuquén, Limay and Negro Basins Authority). The AIC inspects the operations of hydroelectric concessionaries and manages the water resource to combine its different uses: hydroelectric generation, irrigation of fruits and vegetables, industrial usage and human consumption.

Fernando's tasks consists of the simulation of conceptual hydrological models (daily basis) for different meteorological scenarios in the short, and long term, dam modelling and its compatibility with different water uses.

Fernando is a Civil Engineer (UBA), with expertise in Hydraulics and Hydrology. He is currently in the process of aquiering Master of Energy and Environmental Policy (thesis in progress) Fundación Bariloche, National Comahue University, UNCo.

Fernando is also an Adjunct Professor –Engineering Faculty, UNCo, and the former director of the career of Civil Engineering.

#10: Sustainable Water Management under Climate Change in Small Island States of the Caribbean (Water-aCCSIS) (project # 107096)

Geographic focus: Barbados, Jamaica & Trinidad
Project partners:

- University of West Indies

Project description:
This research will investigate the interaction between human activity and ecosystem services, and consider how this affects water availability under projected climate change scenarios. The project will advance our understanding of how a changing climate affects the frequency and intensity of floods and droughts, along with water availability and use, including sanitation needs for vulnerable communities in small island states.

Researchers will develop assessments of future climate change, water scarcity, and vulnerability in representative watersheds in three Caribbean countries - Barbados, Jamaica, and Trinidad. A combination of natural and social science research methods will be employed, such as climate modelling and downscaling, and an analysis of secondary census and economic data will be conducted.

Results will be used to inform the development of national water resource adaptation strategies, building on the University of West Indies' work on climate change adaptation. The project will build the capacity of at least a dozen graduate students. Peer-reviewed publications will be produced to disseminate research findings, and training and educational modules will be created for external stakeholders. Policy outreach to national governments and the Organization of the Community of Caribbean States will also be a priority.

Dr Adrian Cashman
Director of the Centre for Resource Management and Environmental Studies (CERMES)
Email: adrian.cashman@cavehill.uwi.edu

Dr. Cashman is Director of the Centre for Resource Management and Environmental Studies (CERMES) at Cave Hill and Senior Lecturer responsible for water resources management. He is a Chartered Engineer and has been involved in water management in one way or another during his career. His areas of responsibility include the management and strategic direction of CERMES, identifying teaching, research and outreach needs in the Caribbean related to Natural Resources Management. In addition, he is responsible for the water resources management stream and also teaches research methods, field studies and manages several water related projects. Dr. Cashman's expertise is in water governance, regulation and policy as well as the impact of climate change on water availability. He is Principle Investigator for Sustainable Water Management under Climate Change in Small Island States of the Caribbean (Water-aCCSIS) research project.

Anuradha Ann Maharaj
Research Assistant at the Centre for Resource Management and Environmental Studies (CERMES)
Email: maharajanuradha@yahoo.com

Ms. Maharaj is presently a Research Assistant with the Centre for Resource Management and Environmental Studies (CEREMES), the University of the West Indies (UWI), Cave Hill, Barbados. She holds a BSc. in Geology with a major in Geography and an MPhil in Geology from the UWI, Mona Campus, Jamaica.

Her specialty areas are: flood management and modelling, disaster management, geology/ geography, water-climate change related research, water availability modelling and assessment and cartography. Her main focus is hydrological modelling and she is familiar with several models including HEC-HMS, HEC-RAS, MODFLOW, WEAP and VENSIM. She has extensive knowledge in and application of Geographic Information Systems (GIS).

Ms. Maharaj is responsible for the Work Package 10: Water Availability Modelling; of the IDRC Water-aCCSiS Project. Her aim is to investigate the present available water and the future changes in availability given projected climatic decreases in precipitation for the region.

#11: Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA)

Geographic focus: Africa and Asia
Project partners:
Four consortia, each with a number of partners. The workshop participants are from the HI-AWARE consortium, which consists of:

- International Centre for Integrated Mountain Development, Nepal
- Bangladesh Centre for Advanced Studies
- The Energy and Resources Institute (TERI), India
- Climate Change, Alternate Energy and Water Resources Institute of the Pakistan Agricultural Research Council
- Alterra, Wageningen University and Research Centre, the Netherlands

Project description:
Some parts of the world are especially vulnerable to extreme effects of climate change, such as sea level rise, changes in precipitation patterns, and glacial melt. These endanger the livelihoods of vast, poor populations. Semi-arid regions, deltas, and glacier and snow-pack dependent river basins are three such climate change "hot spots."

CARIAA's three climate change hot spots straddle countries and regions in Africa and Asia. Each hot spot is home to large numbers of poor people whose livelihoods depend on climate sensitive sectors. Every country and region is unique, but the changes underway have comparable biophysical and social implications within each hot spot.

CARIAA aims to build the resilience of vulnerable populations and their livelihoods in the three hot spots by supporting collaborative research to inform adaptation policy and practice.

CARIAA consists of four research consortia, of which the Himalayan Adaptation, Water and Resilience (HI-AWARE) is one. The two workshop participants are both part of the HI-AWARE consortium.

Dr Abu Syed

Fellow at Bangladesh Centre for Advanced Studies (BCAS), and founding Co-Director of Nansen-Bangladesh International Centre for Coastal, Ocean and Climate Studies (NABIC)
Email: abu.syed@bcas.net / mabusyed@gmail.com

Dr. Abu Syed is a Fellow at Bangladesh Centre for Advanced Studies (BCAS) since 2008, and founding Co-Director of Nansen-Bangladesh International Centre for Coastal, Ocean and Climate Studies (NABIC), Bangladesh, since November 2011. Co-Principal Investigator, HI-AWARE. He is a member of the General Assembly of IMPACT 2C with World's Leading Scientists, and has been Coordinating Lead Author of Assessment on Peri-urban Agriculture in South Asia, East and West Africa. He is leading several climate, ecosystem, coastal modeling and impacts studies. He has many publications in peer

reviewed journals and book chapters in his credit on climate modeling, ecosystem modeling, forestry, remote sensing, GIS, food security, NRM and adaptation. Dr. Syed was born in Chittagong, Bangladesh in 1968. His PhD research had been on downscaling GCMs to South Asian regional model applying WRF model and nesting to further higher resolution. His interests are to develop capacity in advanced scientific research (RS, GIS, climate, coast & ocean modeling in universities and research centers in Bangladesh and developing countries).

Suruchi Bhadwal

Associate Director, Earth Sciences and Climate Change Division of The Energy and Resources Institute (TERI)

Email: suruchib@teri.res.in

Ms Bhadwal leads research activities in the area of climate change, focusing mainly on impacts, vulnerability and adaptation and works in close association with the communities.

She has been with TERI since October 2000 and has contributed to several projects. Some of the key projects she has worked on include a study on vulnerability to climate change in the Indian agricultural sector in the context of economic globalization, (supported by CIDA and the Government of Norway), contributions to India's first and second national communications submitted to the UNFCCC and World Bank supported study on vulnerability to climate variability and change through an assessment of issues and options for adaptation.

Ms Bhadwal is also listed as a UNDP regional roster of expert on vulnerability and adaptation. Furthermore, she has been identified as a Member by the Planning Commission as part of a Working Group on Climate Change and Environment for the XIIth V Year Plan (2012-2017). She has also been closely associated with the International Human Dimensions Programme attending numerous open meetings and Institutes organised by them. At COP events she has been actively involved, as an observer, organizer and contributor.

She has published several papers on related issues and has contributed as a Lead Author for the IPCC AR4 WGII Report. She is also a Review Editor for the IPCC AR5 WG II Report and a Volunteered Editor for the IPCC Special Report on Extreme Events.

Ms Bhadwal has a Masters in Environmental Sciences from Hissar in Haryana.

Workshop Organisers

Dr Charlotte MacAlister

Senior Program Officer at the International Development Research Centre (IDRC)

Email: charlottemacalister@gmail.com

Charlotte MacAlister is a Senior Program Officer in the Climate Change and Water program, based in Ottawa, Canada. Charlotte's primary research focus is hydrological and water resource modeling, the quantification of ungauged systems (climate and hydrology), and water resource management for sustainable development in a changing climate.

Before joining IDRC, Charlotte worked for the International Water Management Institute in Addis Ababa, leading projects in the Nile Basin Development Challenge and the USAID Feed the Future Program. Her projects included modeling the hydrological, productivity, and socio-economic impacts of water resource management and climate change in the Nile Basin, and targeting of agricultural intensification in the Ethiopian Highlands. She spent most of the previous decade working in the

water and development sector in Southeast Asia for organizations including the Mekong River Commission, GEF, and UNDP. She also supported the Global WWF Water Stewardship Program as an Agricultural Water Advisor.

Charlotte was a founder of the CGIAR Spatial Analysis and Modeling – Topic Working Group. She has a BSc in environmental studies from Manchester Metropolitan University, and an MSc in irrigation and PhD in hydrology from Newcastle University, UK.

Walter Ubal Giordano
Executive Director of the IDRC Environmental Manage ment Secretariat for Latin America and the Caribbean
Email: WUbal@idrc.ca

Walter Ubal Giordano joined IDRC in 2002 as Executive Director of the Environmental Management Secretariat for Latin America and the Caribbean. Before joining IDRC, he managed a regional initiative in central and southeastern Europe for the United Nations Development Programme. He has acted as a consultant on environmental management for United Nations agencies including the Food and Agriculture Organization and the Industrial Development Organization. He has completed postgraduate studies in environmental management systems and statistics at WYE College in London, England.

Dr Chris Lennard
Research officer in the Climate System Analysis Group (CSAG) at the University of Cape Town (UCT)
Email: lennard@csag.uct.ac.za

Dr Chris Lennard graduated with degrees in Oceanography, Zoology and has a Ph.D. in Climatology from UCT. He is officially employed as a regional climate modeller, however has other interests that include the quantification of changes in extreme climates (particularly rainfall and wind climates), communication of climate information and understanding how climate information is assimilated by communities that need climate information for their decision making frameworks.

Dr Chris Lennard is a member of the CORDEX scientific advisory team, runs the CORDEX-Africa Analysis campaign and was a lead author of Chapter 22 in Working Group 2 of the IPCC 5th assessment report.

Katinka Lund Waagsaether
Scientific officer in the Climate System Analysis Group (CSAG) at the University of Cape Town (UCT)
Email: Katinka@csag.uct.ac.za

Katinka graduated with a Masters of Environmental and Geographical Science degree from CSAG in 2012. She then spent around three years working for a South African Non-Governmental Organisation (NGO) before she re-joined CSAG in early 2015. During her years with the NGO her main focus was on vulnerability, adaptation and participatory processes, through a combination of research, project development and implementation and the running of trainings. She was also the coordinator of the South African Adaptation Network for a number of years, and contributed to the project development work of the South African National Implementing Entity (NIE) to the Adaptation Fund. When returning to CSAG Katinka joined the Climate Services team, where her role is to provide expertise on the application of climate information in decision making, contribute to the intellectual direction of the climate services

activities and support the development of cognate research threads within the Climate Services team.

Dr Katharine Vincent
Director Kulima Integrated Development Solutions (Pty) Ltd
Email: katharine@kulima.com

Dr Katharine Vincent's particular interests are vulnerability to climate change and adaptation, including the effective use of climate services to inform decision-making and promote adaptive development. Her current role is a Director of Kulima Integrated Development Solutions (Pty) Ltd (www.kulima.com), a South African-based consultancy that undertakes various assignments as a boundary organisation at the interface between scientists and end-users, including policy-makers, practitioners and grassroots level community members. Her current projects include climate screening of local development plans in Zambia; applying a gender lens to research on migration in deltas and the circumstances in which it forms an adaptation for men and women; developing country-driven adaptation project proposals for international climate finance; investigating the potential for sovereign climate insurance in Africa; and facilitating a stakeholder-driven co-production of climate services in order to produce tailored and targeted information for medium-term planning processes.

Zvia Leibler Danon
Education Division Manager, CATHALAC
Email zvia.danon@cathalac.int

With CATHALAC since 2004. Zvia has been developing international and regional education programs since 2009 within CATHALAC's Education Division. Her ongoing responsibilities include developing and promoting professional capacity development programs, identifying and developing strategic partnerships with academic institutions, international organizations, governmental agencies and non for profit organizations; and developing university programs and internships. Previously managed the Development and International Cooperation Division at CATHALAC where she devoted her time to identify and develop partnerships, as well as community development projects, and raising regional awareness through innovative initiatives and campaigns such as the Latin American and Caribbean Water Prizes. Holds a BA in International Affairs from Florida State University and is a MBA candidate, Florida International University, 2016.

Dr Osvaldo Jordan
Research Associate, CATHALAC
Email: osvaldojordanpanama@yahoo.com; osvaldo.jordan@cathalac.int

Osvaldo Jordan Ramos, has a doctoral degree in Political Science from the University of Florida. He has worked as a consultant for the Panamanian government and for national and international NGOs on biodiversity conservation, community participation and indigenous peoples. His research focuses on indigenous movements, natural resource conflict and environmental policy. He has worked as an instructor on environmental conservation, comparative politics and racial and ethnic issues in several universities in Panama, Costa Rica, and the United States.

Roxana Segundo
Manager-Projects, CATHALAC
Email: roxana.segundo@cathalac.int

With CATHALAC since 2005 has worked promoting strategic alliances, mobilizing resources for the organization through international cooperation and ensuring institutional compliance for projects' funding and grant management requirements. Previously, has worked with Environmental NGOs, and former Executive Director of the Metropolitan Park, a unique protected area within Panama City. Over twenty years of work with the U.S. government.

Cristina Tedman
Education Programs Officer CATHALAC
Email: cristina.tedman@cathalac.int

Cristina Tedman Lezcano, holds a Master degree in Project Management from Universidad Interamericana de Panamá (Inter-American University from Panama) (2013), BA in Anthropology and a Latin American Studies minor from University of Florida (2010). She did her Departmental Honors Thesis on Child Labor Discourse and the Ngäbe-Buglé indigenous group in Panama. Cristina has worked at the United Nations as Communication Assistant in the Environment and Energy Unit at UNDP (2012), and as Programme Associate at UN Women (2013). Currently, she works for the Division of Education of CATHALAC as a coordinator of international education programs.

Monica Lopez
Education Programs Officer CATHALAC
Email: monica.lopez@cathalac.int

Monica works as Education Programs Officer for CATHALAC. She is an anthropologist from the University of Antioquia, Colombia and has a Masters in International Cooperation: Peace and development from the University of the Basque country, Spain.

She has more than eight years of work experience in defending and promoting the rights of groups in vulnerable situations; women, children, displaced and indigenous populations; through coordination and support of social development projects, of both government and nongovernment entities. As Social Manager she implemented social community strategies to mitigate the social and environmental impacts of infrastructure projects in high risk urban areas in Medellín, Colombia. Her services included technical assistance and training in different areas like protection, first generation rights, environmental conservation, Gender Based Violence and the rights of socially vulnerable populations.

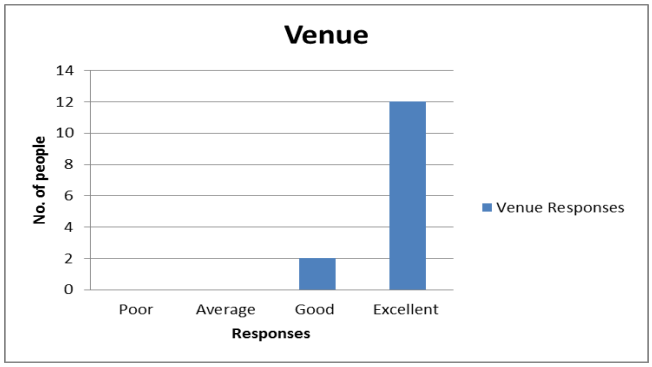
Annex D: E-learning modules from the first workshop

Module 1: An introduction to climate data
http://prezi.com/ozzyiozynscn/?utm_campaign=share&utm_medium=copy
Module 2: An introduction to climate models
http://prezi.com/lbq7r5fbvll-/?utm_campaign=share&utm_medium=copy
Module 3: An introduction to future climate projections
http://prezi.com/2g_8zejkskph/?utm_campaign=share&utm_medium=copy
Module 4: Downscaling climate data
https://prezi.com/3loxapmy_nmv/4-downscaling-climate-data/?utm_campaign=share&utm_medium=copy
Module 5: An introduction to the challenges of applying climate data
https://prezi.com/ow0n39lsdfnm/5-the-application-of-climate-data/?utm_campaign=share&utm_medium=copy
Module 6: Adaptation in the context of Impacts & Vulnerability
http://prezi.com/pkts1h2_zbfz/?utm_campaign=share&utm_medium=copy
Module 7: Communication for research based decision making
http://prezi.com/rubi1epafzim/?utm_campaign=share&utm_medium=copy

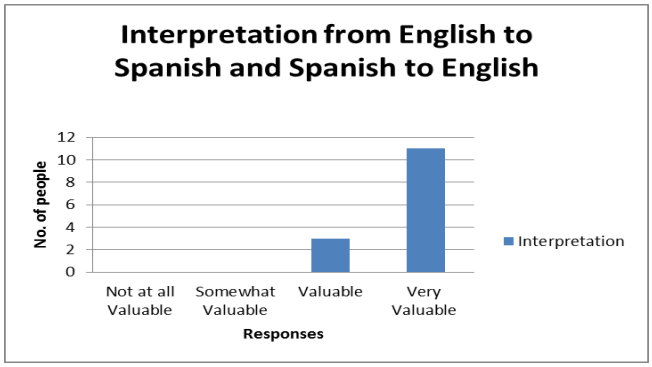
Annex E: Results of the workshop evaluation survey

Question 1: The organizing and logistics for the workshop was

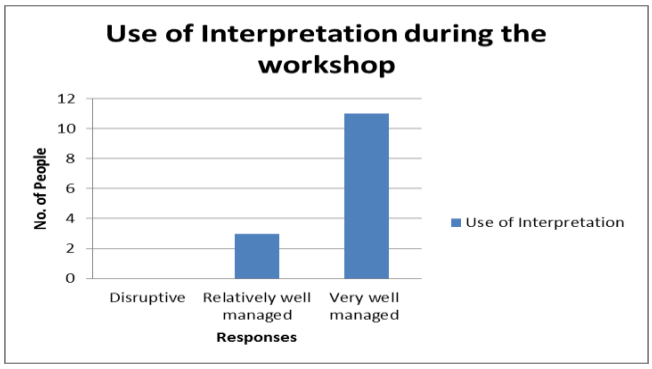
Question 2: The workshop venue was



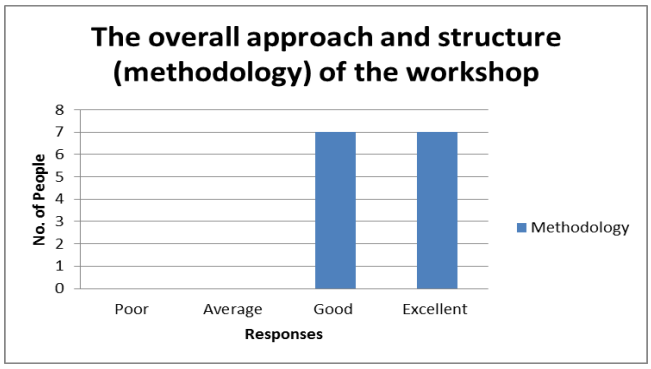
Question 3: Having interpretation (English to Spanish / Spanish to English) available at the workshop was



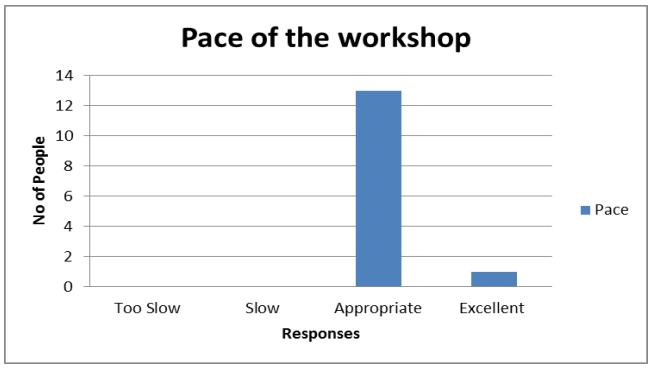
Question 4: The use of interpretations in the workshop was



Question 5: The overall approach and structure (methodology) of the workshop was



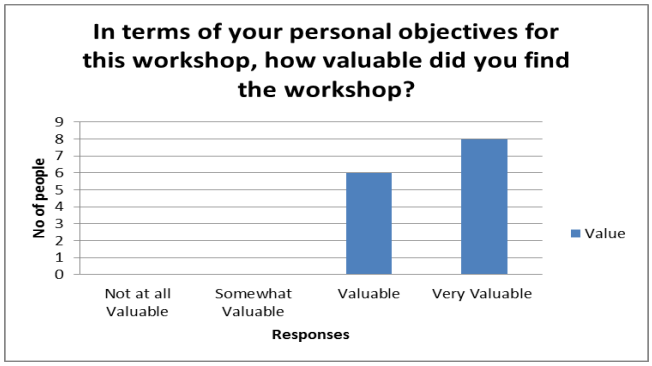
Question 6: The pace of the workshop was



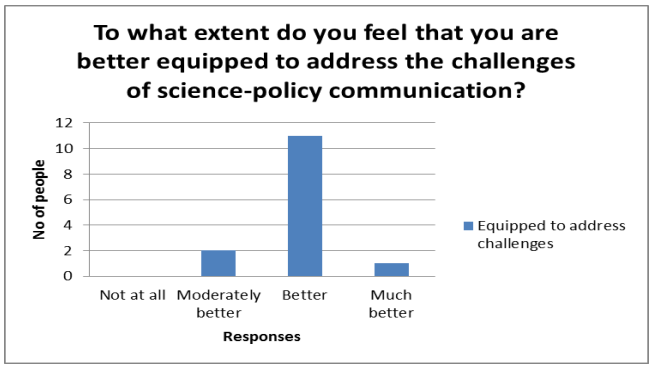
Question 7: The workshop facilitation was

Question 8: To what extent do you feel that the workshop process enabled the group to meet the workshop objectives?

Question 9: In terms of your personal objectives for this workshop, how valuable did you find the workshop?



Question 10: Following the workshop, to what extent do you feel that you are better equipped to address the challenges of science-policy communication?



Question 11: What was the most valuable part of the workshop for you? Please provide a reason for your answer.

- The discussions between the different groups helped in understanding the gaps in disseminating the information at various different levels.
- Realizing that the way and the type you take to send the message to the policy decision maker is as important as the messages itself
- Most of parts
- The part when the three groups share their wish lists is the most valuable part for me. This lets us know what these people are thinking about and thus we can think about how we can bridge the gaps.

- realisation and confirmation of the challenge and to meet and understand others who are involved in the initiative. To listen to others' programs and to see possibilities was interesting.
- Learning, based on the feedback from all the modellers on the issues that they face, that we all face the same problems
- The commitments section
- Listening to other projects' experiences.
- The tools for better understanding of a message.
- Interaction with decision makers
- The approach to identify things such as obstacles, categorising them and then assessing those which are the ones we can solve and within what time frame. The contribution from decision makers helped in this aspect
- The ability to interact with different actors and interested persons in the issue of the relationships between science and decision-making related to Climate Change.
- I think the sequence in which the workshop was led was extremely favourable. Each part of the workshop was concatenated and contributed to the following.
- The ability to learn from similar experiences in other contexts.

Question 12: In what way can such a workshop process be improved?

- By sharing experiences or learnings from other countries
- I really believe the organizers have done a good job, but perhaps letting more time to explain each projects of the different countries. Some of them seems to be very valuable.
- No comments
- Some people keep talking all the time.
- It would have been better to hear what different initiatives are engaged in and also a discussion on how the challenges felt is also impacting at global policy discourse and advocacy.
- More sessions with policy-makers to understand better their needs in how we communicate data to them.
- Presenting case examples and methodologies related to the issues discussed.
- Having more policy makers in the room.
- Bring creative people in communication rather than technical experts.
- The workshop went well.
- It can include topics that can help (especially scientists) to better communicate their results and establish partnerships, especially with civil society, to influence decision-making.
- Even though the dynamics of participation and discussion are valuable, maybe.
- There could be a follow-up (maybe bi-annual) on the results of the workshop, and if these are contributing directly or indirectly on projects under development or in the preparation of new projects.
- Receive more support from policy makers.

Question 13: What action would you like to see happen following the workshop?

- To develop a blog for the workshop, were participants can interact and write about their experiences from the project. To discuss about future collaborations within different countries.
- A more engage of the decision makers in the consequences of the climate change.
- I want to see the communication could be maintained among the participants.
- All participants keep each other in contact through facebook or other social media.
- Follow up of what we discussed. IDRC attempting to bring regional efforts in coming days building on the strength and knowledge that we have and also workshop to equip participants with communication skills required for the purpose.
- Continual communication between and amongst attendees through social media.
- Further discussion based on each country experiences and approaches.

- Concrete follow up on the commitments and feedback to us all on how well they have worked. The other thing might be to have the workshop written up as a case study and not just as a report.
- I would like first to attempt institutional changes to see communication as an investment rather than expenditure that can be cut out of the budget. Second, explore which strategies are price-value.
- Maintain contact with members.
- Increase communication and eventually be supported by other participants. We are already doing so: Mr. Vicuña was with us this week. It would also be useful to receive some support with political issues - decision makers. I give you an example: in my country many scientists and technicians perceive that the current Government is taking many decisions without appropriate information and only use scientific information when it suits to support decisions already taken. Experiences of other participants in this situation would be helpful.
- A report that summarises and provides feedback to participants regarding the discussions, conclusions and lessons generated, beyond a simple description of the activities. It would also be very valuable to finalise the "community of practice," perhaps at regional level (Latin America - Africa - Asia) by using, for example, social networks (Facebook page).
- I would like to have a summary and the results of the workshop.
- To try keeping contact and exchanging experiences.